TECHNOLOGY DEPT.

Gas Journal

VOL. 283. 107th YEAR. LONDON, SEPTEMBER 28, 1955 Nº 4817. PRICE 1/3

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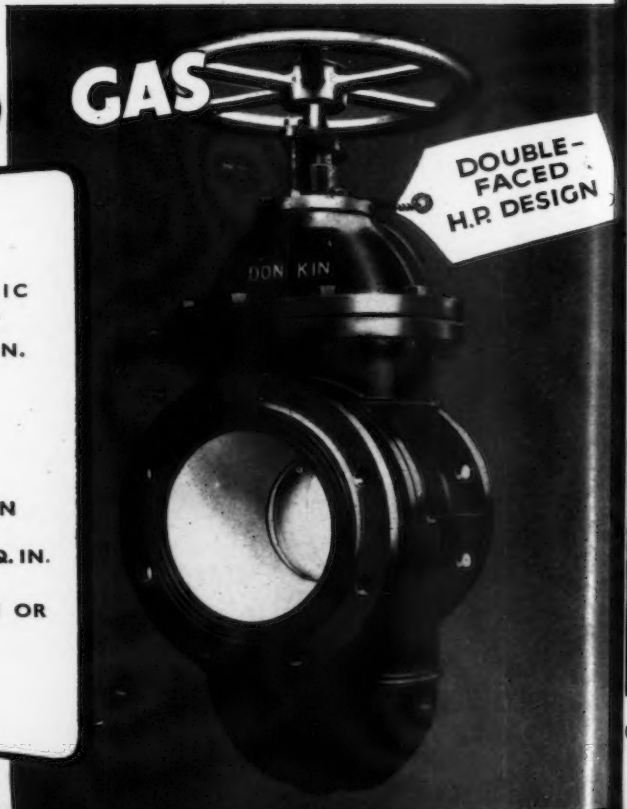

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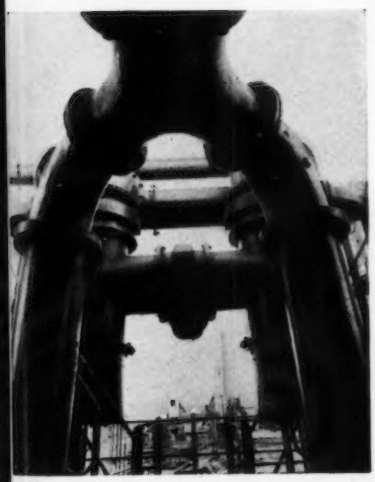

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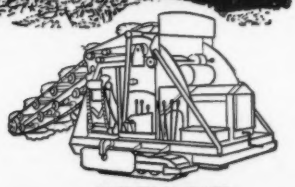

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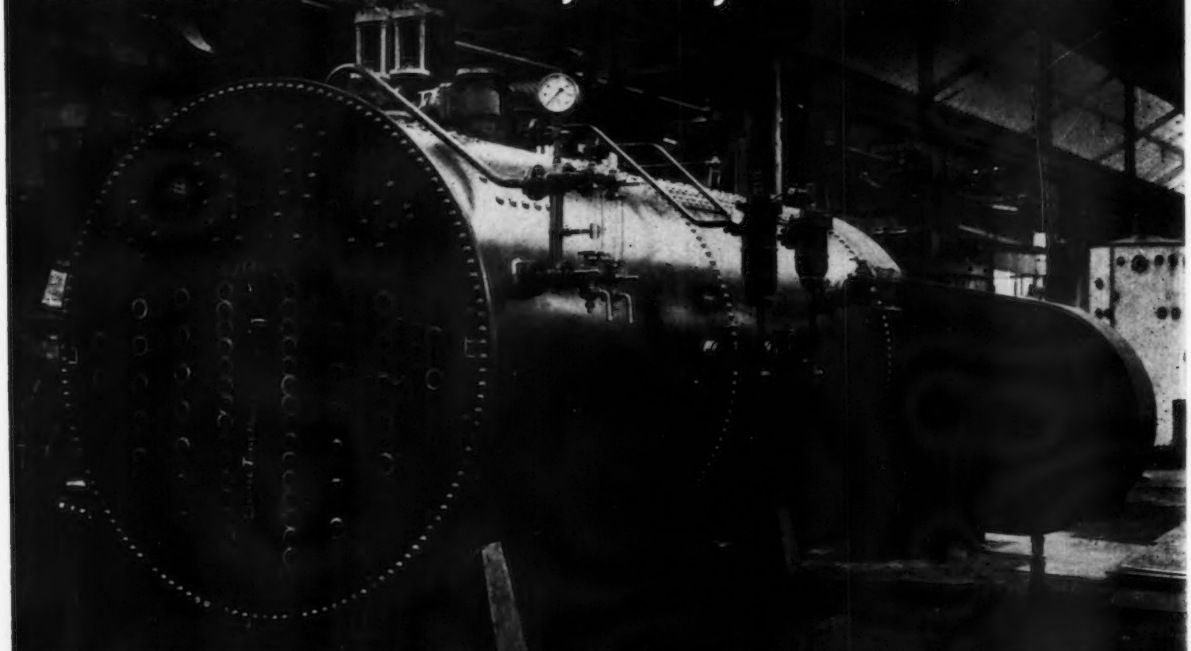

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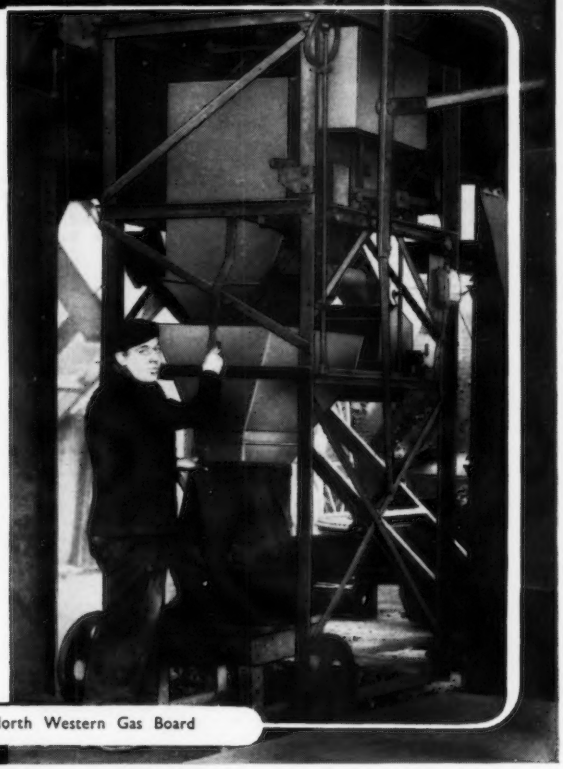

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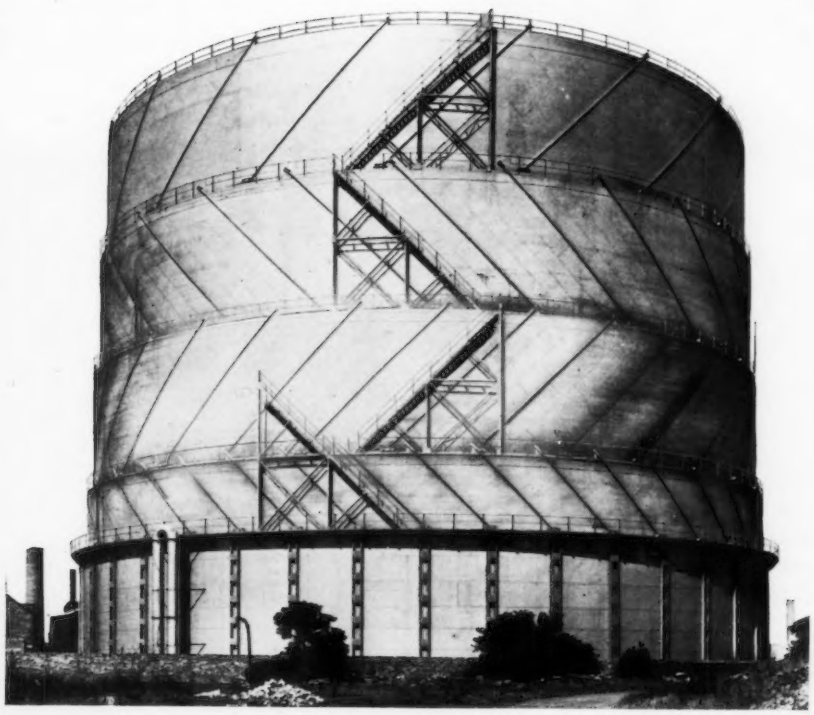

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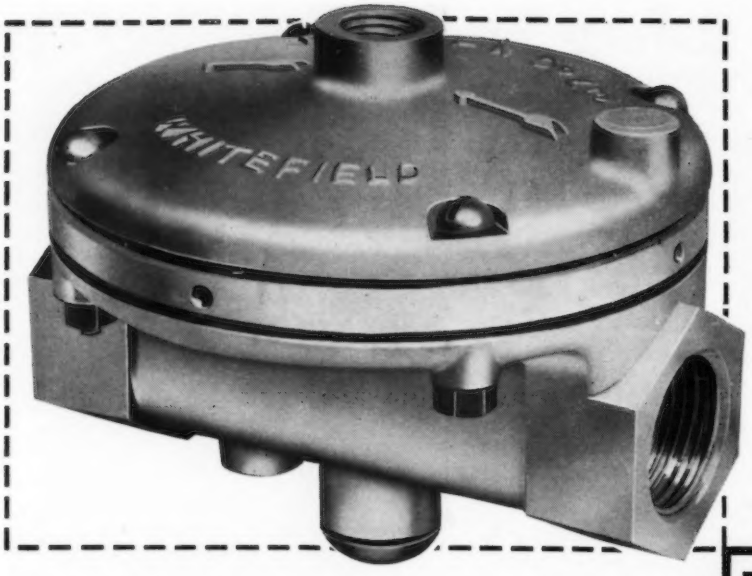

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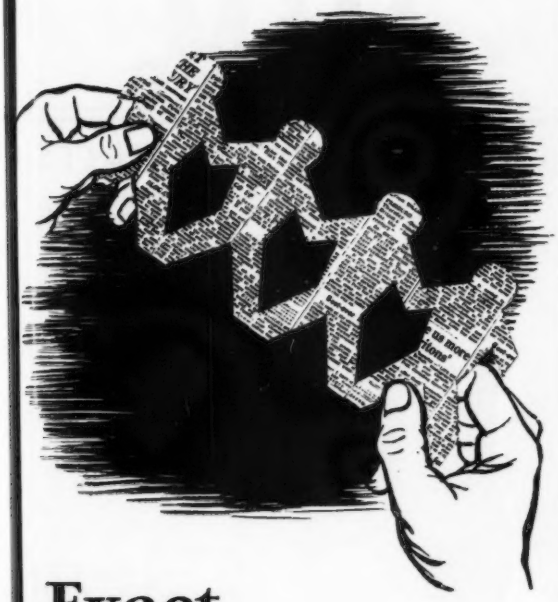

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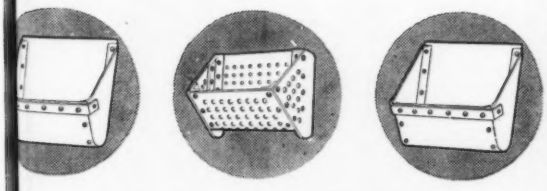

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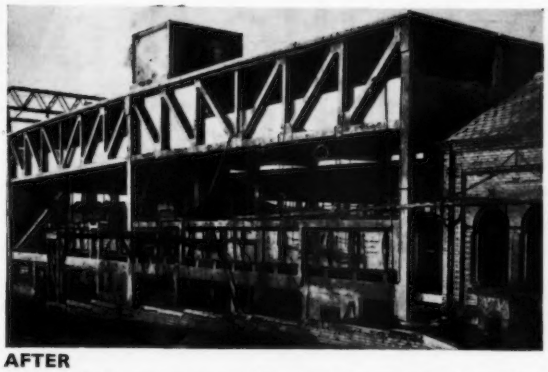

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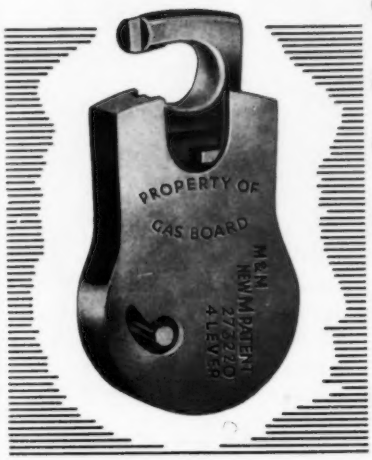

- **DON'T** buy locks you may have to scrap in a few years
- **DON'T** look only at the initial cost
- **DON'T** think only of the present time; look to the future
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- **DO** profit by others' experience and use M. & M. Locks to protect your meter

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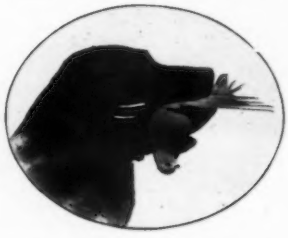

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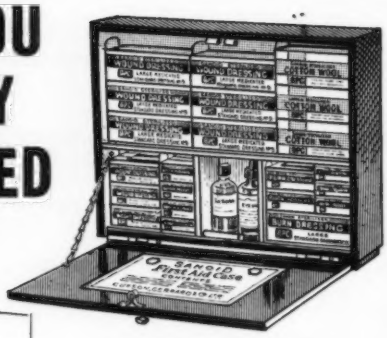

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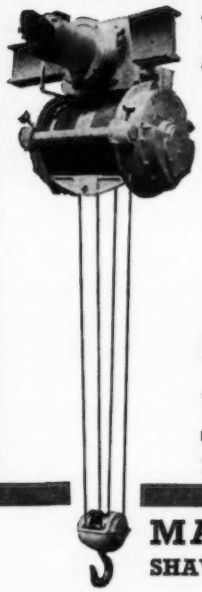

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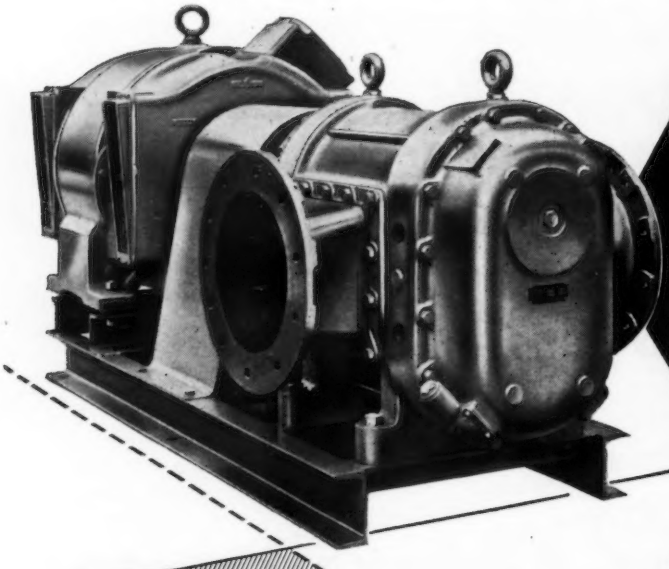

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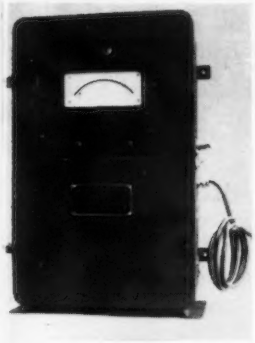

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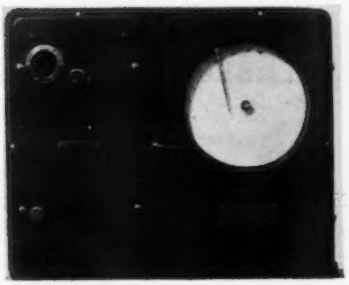

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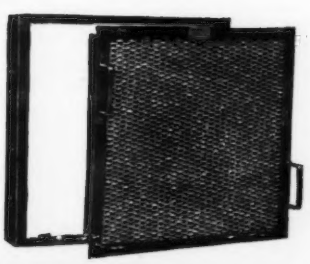

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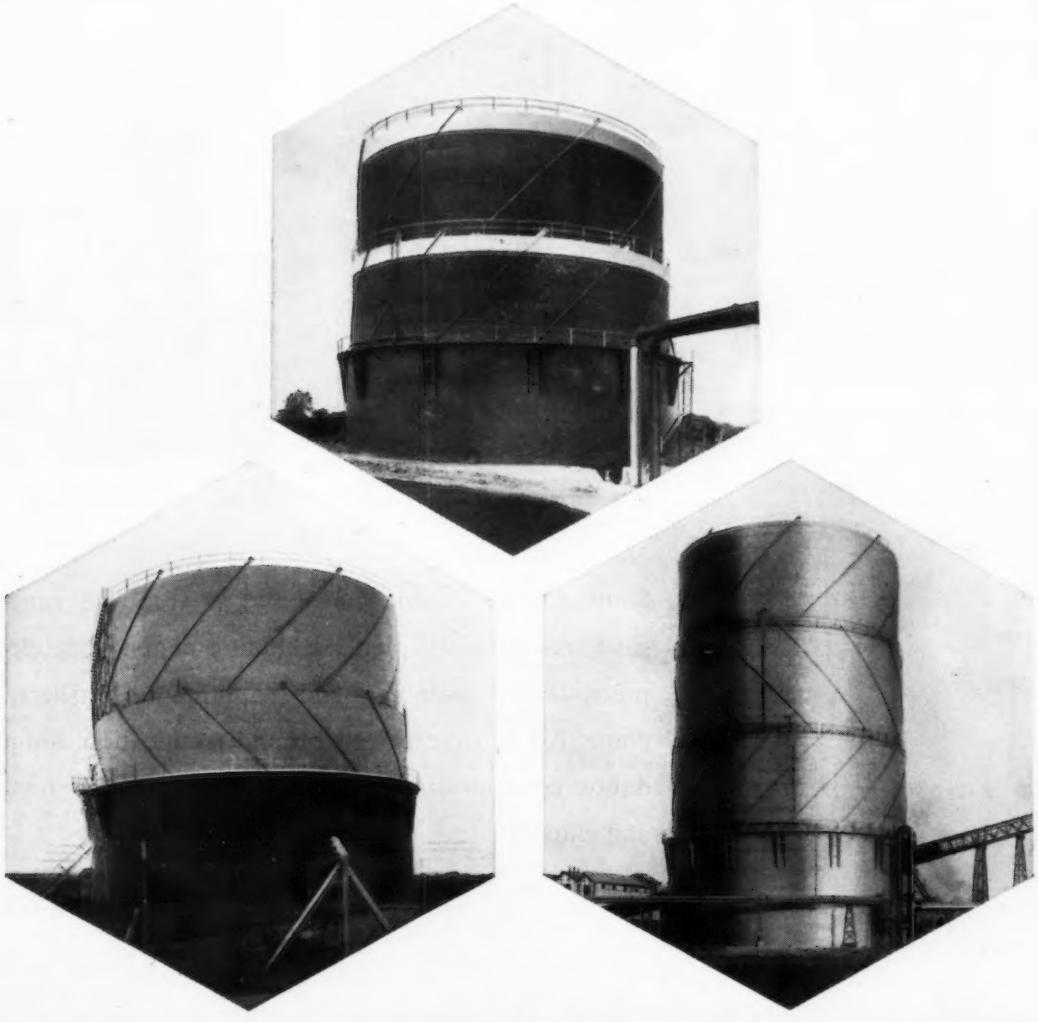

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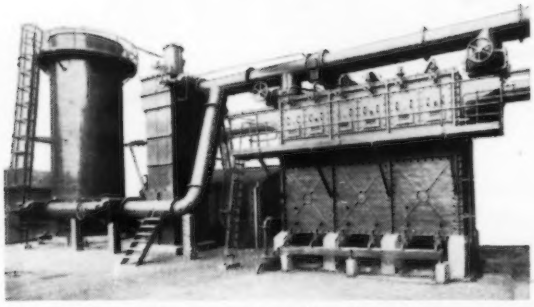
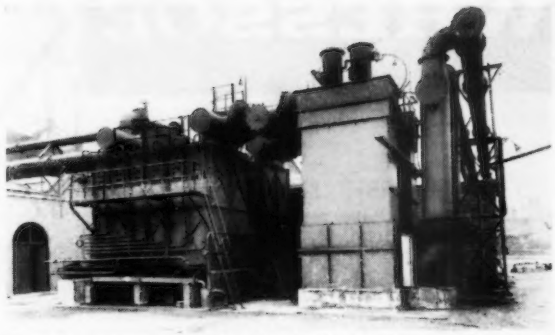
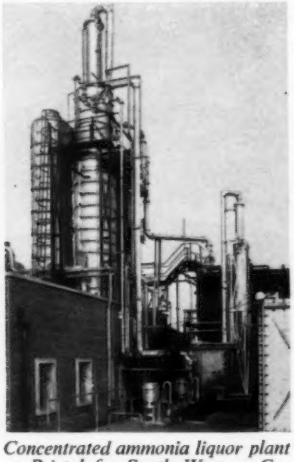


Wet purification plant comprising mild steel condenser, cast iron ammonia washer and plate-type electro-detarrer at Norwich for Eastern Gas Board.

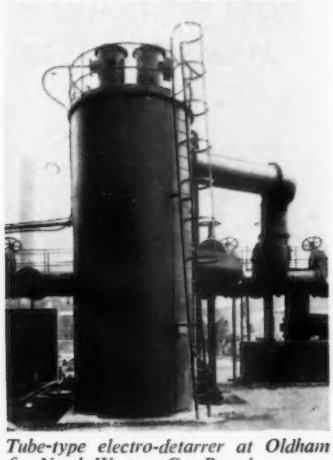


Washers and detarrers at New Wortley for North Eastern Gas Board.

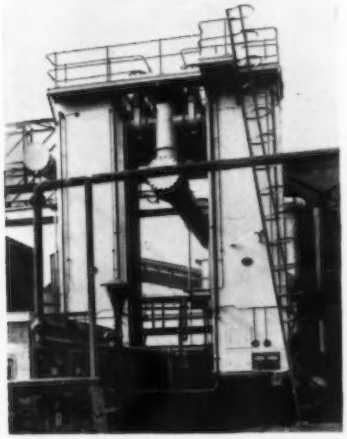
Effluent liquor treatment plant for Southern Gas Board.



Concentrated ammonia liquor plant at Bristol for South Western Gas Board.



Tube-type electro-detarrer at Oldham for North Western Gas Board.



Mild steel vertical water-tube condensers at Bristol (Canon's Marsh Gasworks) for the South Western Gas Board.

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Gas Journal

VOL. 283 NO. 4817 September 28, 1955
107TH YEAR

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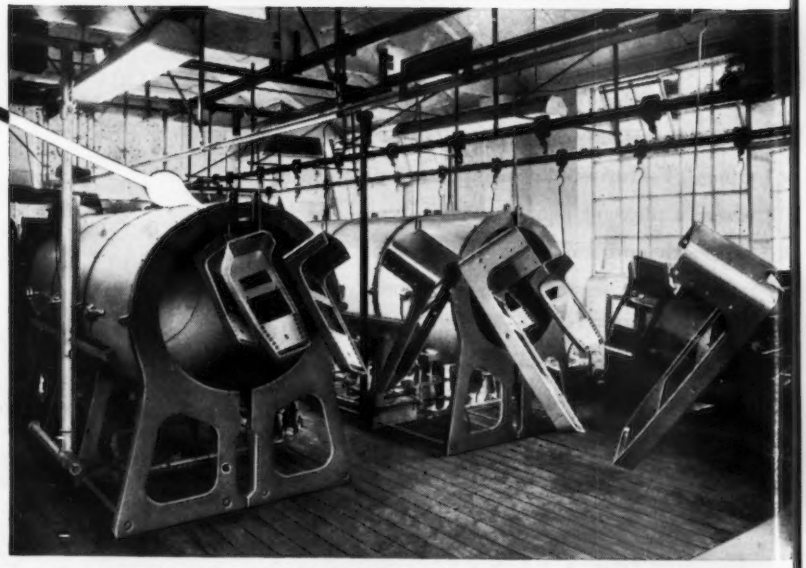

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Gas Journal

VOLUME 283. No. 4817. SEPTEMBER 28, 1955. 107th YEAR

The Sheringham Meeting

EVERYONE concerned with last week's meeting of the Eastern Section of the Institution of Gas Engineers at Sheringham is to be congratulated on the success of a function which only a few weeks ago appeared to have been written off as one of the casualties of the railway strike. Despite the indefinite postponement the attendance was very little less than it would have been in June, when the weather was much less congenial, and the full programme into which the committee and officers had put so much energy three months ago was carried out without a hitch. The success of such a meeting depends largely on the Secretary and those who help him, and on this occasion as at all times since he undertook the duty shortly after his Presidency of the former Eastern Association Mr. J. Hunter-Rioch scored a triumph, deservedly shared by Mr. Wosencroft and Mr. Coulson, of the Cambridge staff, who took care that no detail was neglected. As in 1952, the headquarters of the meeting were at the Grand Hotel, an ideal venue for that kind of assembly, and so warmly did the members appreciate the service they received that they readily endorsed the suggestion made by the Chairman of the Sheringham Urban District Council. at the official luncheon, that the manager should be called in and publicly thanked. The hotel, it appears, is in the market, and it would be a great pity if it ceased to be available for such occasions. As will be gathered from our report on p. 828, the meeting was as attractive to the ladies as it was to the members who, besides listening to the Chairman's Address of Mr. W. A. Evetts, reported on pp. 815-819 of this issue, benefited from a valuable paper on 'Some Power Problems involved in the Manufacture and Distribution of Gas,' by Mr. Bernard Wilkinson, Divisional Planning Engineer at Watford, to which we shall refer in a later issue. It should also be added that copies were distributed of a supplement to the paper on 'Technical Problems in the Utilization of Town Gas in Industry' which Mr. F. Dickinson and Mr. F. J. Johnson presented to a meeting of the Section in London last February.

The annual meeting, as Mr. E. H. Winch pointed out in moving a vote of thanks to the Chairman, is the culmination of the Chairman's year of office, and had the meeting not been possible, not only would the Chairman's efforts have gone unrewarded but the members themselves would have been the poorer for having been denied the opportunity of hearing Mr. Evetts' address. Only three years ago Mr. Evetts was awarded the Institution Gold Medal for a paper presented to the 1952 annual meeting, and the address he gave at Sheringham was of the high standard we have learned to expect from him. He did no little service in focusing attention on the comparatively small rise in the price of gas since pre-war days in relation to the rise in costs of the raw materials and labour involved in its production. It is to be hoped that his statement will not go unnoticed by those who sometimes seem only too willing to regard the gas industry as old fashioned and uneconomic. We sometimes wonder whether the industry makes as much as it should of its strong points, and whether it is as good as some of its competitors in keeping the public informed of the service it can offer. It may be that one reason why the industry often seems to be at a disadvantage in competing for entrants to the technical side is that it does not proclaim sufficiently the up-to-date technical advances it has achieved, which, if they do not hold the glamour of the atomic age, do provide a profitable field for the exercise of a wide range of engineering and other sciences.

Defining productivity Mr. Evetts showed that since 1939 there had been an appreciable reduction in capital expenditure at Watford and St. Albans per mill. cu.ft. of gas sold. The opening passages of his address were important for the way in which the case was stated for the gas industry today. He reminded his hearers that the bogey of falling consumption per consumer is not peculiar to our industry alone, and they were grateful for having this put, to use Mr. Evetts' own words, in the proper perspective. In the latter part of the address attention was drawn to the alternative sources of raw material which are becoming available for gas making as a result of progressive technical development. Mr. Evetts pointed the way to making available to the general public even more heat in the form of gas and coke by using in the gas industry's own processes the more troublesome by-products—breeze and tar—which have not been considered to be necessary in the past. These should all help to cheapen the cost of the main product. We quote again from Mr. Winch's tribute to an outstanding address when we add that the thoughts which Mr. Evetts put forward were no idle dream born in a period of reflection, for he is an

engineer who practises what he preaches, and the undertakings with which he is personally concerned are always well in the forefront of progress.

The Coke Oven Contribution

THE inauguration last week of the extensions to the coke ovens of the Stanton Ironworks Company highlighted the important contribution which such plants are making to the nation's gas supply and, to a lesser degree, to the provision of the coke required by our industrial and domestic markets. A glance at the figures given in the article which appears on p. 811 of this issue will show that the amount of gas now available to the East Midlands Gas Board from Stanton is in the region of 24 mill. cu.ft.—equivalent to the output of a very substantial gasworks. Furthermore, this gas is so economically produced that it can be sold to the Board for a price which makes the gas engineer in other parts of the country sigh with envy. Naturally, there are very sound reasons for the Stanton Company being able to release such large quantities of gas which are not only purified to the necessary standard for town distribution, but also diluted to the requisite calorific value. The chief reason is that the Company has been to immense pains and has undertaken a great deal of expense in order that the coke ovens might be fired with cleaned blast-furnace gas, thus releasing an equivalent amount of coke-oven gas for use elsewhere. Obviously the Stanton Company has not made these elaborate arrangements, costing literally millions of pounds, primarily to boost supplies to the East Midlands Gas Board. Their main concern has been to organize the overall production of their integrated plant in the most economical manner, and a prime factor in this is the useful disposal of the vast quantities of blast furnace gas produced during the iron-making process. Since this gas has a high inert content and a low calorific value it is not, itself, suitable for use in a town gas grid. The solution to the problem—one that is widely used in steelworks—is that already described.

A very significant fact is, moreover, that the steelworks coke ovens and the coking plants of the National Coal Board, between them, are supplying something of the order of 70,000 mill. cu.ft. of gas per year to the British gas industry, about 13% of the total gas distributed. It is true that most of this gas is supplied to a relatively few area boards and that most boards do not receive any at all. It is also true that most of it is available at or near to the coalfields so that the cost of its manufacture bears relatively little charge for coal transportation. However, it is well worth while for such as the East Midlands, Wales and Northern Gas Boards to take gas where they can get it from these independent coking plants, even though accompanying distribution costs may be somewhat higher than if the gas had been manufactured in a works near the centre of a large concentration of consumers. As charges for coal transportation continue to spiral upwards, the idea of locating gasmaking plant near to the source of the coal becomes more and more attractive. If, in the course of the years, a national gas grid comes into being it may be well worth while to consider situating a large proportion of the country's gasmaking plant on top of the coal, leaving only secondary plants at various centres to provide for seasonal and local loads. In the meantime the coke ovens of such as the Stanton Ironworks Co., Ltd., will continue as most useful allies of the gas industry in meeting the ever-increasing demand for supplies of reasonably-priced gas.

DEEP EXCUSES

THE National Coal Board recently announced a deficit for the second quarter of this year of over £19 mill. It was quite apparent in July, when the Board announced a general overall increase in the price of coal of 18%, that without that increase a large deficit might be expected in the future. Now, the justification for such a large increase is made clear and it is to be hoped that it has been sufficiently effective that such a staggering deficit cannot possibly occur again for a very long time. But to raise the price of coal is not necessarily the best means of balancing the losses. It is perhaps the easiest but it is unpopular and, above all, it is surely the most brazen admission of failure. As we might have expected, the Board has trumped up some very plausible excuses for the losses. Apart from the fact that the June quarter included both Easter and Whitsun holidays and the beginning of the miners' annual holidays the excuses include:

(a) The introduction of a national day wage structure in April, 1955, estimated to cost £14 mill. a year.

(b) The Yorkshire strike in May, with its serious effects upon output and output per manshift.

(c) The railway strike in June, with consequent effect in stocking and other special costs.

(d) The full emergence of past trends of rising prices, *e.g.*, in roof supports, general stores and repairs, which have also been affected by increased use of special roof supports and fireproof belting.

(e) The increase in other costs due to increasing capital expenditure, more expenditure upon research and training, increases in national insurance contributions, contributions to the National Industrial Fuel Efficiency Service and the general increasing trend of administrative expenses due to the continually rising levels of prices, wages and salaries. The Board points out that opencast results in the June quarter of 1955 have been affected by stocking in consequence of the railway strike and by the general tendency for an increase in production costs which were over 3s. per ton saleable above the same quarter of 1954. The Board had met in this quarter a loss on imported coal of nearly £7 mill. This loss occurs because the imported coal is sold at British prices, which are said to be below those prevailing in most other countries. Higher capital investment has resulted in increased borrowings and thus increased cost of interest.

It has often been shown that there are generally more ways than one of tackling a problem. In this case the N.C.B. are explaining away their losses and ensuring against future losses by imposing considerable price increases. Another, and perhaps a more practicable, means of solution might be to look at those few areas where a profit has been realized and ask why these areas can make a profit when the rest of the country can suffer such losses. It should not be forgotten, for all the emphasis on the deficit that there are some districts which do make profits. It is a notable fact that those areas are all situated in the central coalfields, but it cannot be explained by stating that the profits lie with the better seams, for that is simply not true. The whole of the East Midlands region worked at a profit: Nottinghamshire, 5s. 8d. a ton, South Derby, 4s. 4d., Leicestershire, 4s. 2d., and North Derby, 3s. 2d. In the West Midlands, North Staffs made a profit of 1s. 4d.

a ton and Cannock Chase struck a balance. In all other deep-mine areas of England, Scotland, and Wales there were losses. Generally, Yorkshire shows a profit because of its better seams, and its loss for the June quarter can well be attributed to the strike in May. But for the reasons for the Midlands' profits we must look for something more than just good seams. These areas have consistently shown the best results and a spokesman of the N.C.B. says that it is because they are more recently developed and that they have a higher degree of technical skill. The spokesman agreed that the better industrial relations which exist in the Midlands might be an important contributing factor to their success and the point could be investigated. Now, we suggest that this agreement, incorporating the use of the word 'might,' is far too timid. We believe that it is *the* cause of the Midlands' success, and in order to extend it throughout the rest of the country the Board should study the historical background which gave rise to the better industrial relations. Then they should endeavour to apply the emergent principles, suitably adapted to modern conditions, with the aid of the National Union of Mineworkers. It was after the General Strike of 1926 that George Spencer became president of the Notts Miners' Industrial Union which was shortly afterwards widely known as the 'Spencer' Union. Spencer might well be compared with the equally notable John L. Lewis. It was Spencer who put over to the miners the attitude of 'Produce the coal first, and then you'll get your money.' That attitude has prevailed, and, over the course of the ensuing generation it has snowballed so that now it is the general attitude of most of the Midlands area. So much so, that mining engineers of the highest calibre are attracted to the Midlands because they know that the schemes they plan will be executed better there than anywhere else in the country. If only this 'Spencerian' attitude could be made to prevail everywhere instead of only in the Midlands, then perhaps profits could be made without the need for price increases, and higher wages could be based on a sounder economic foundation.

6th International Gas Conference

Mr. C. A. King, Managing Director of the 'GAS JOURNAL,' who is a member of the British party attending the New York conference, sent this report during the Atlantic voyage.

R.M.S. CARONIA, *September 21.*

NEWS agencies reported this morning that 'Hurricane Ione swept well out to sea today and the Weather Bureau said the East Coast was out of danger barring a sudden and radical change of course.' Well, we were not really sorry, for from our experience of having been dusted by the hem of Ione's petticoat we had concluded she was a pretty violent dame. On the other hand we were secretly rather smug at having made the passing acquaintance, because it is a very rare event for a sea captain to remark to a passenger that he could record in his diary having sailed in a gale of Force 12. That is understood to be something in excess of 90 m.p.h., above which speed they don't trouble to number them. The visitation was from about midnight to 3 a.m. today.

All this may seem irrelevant to the International Gas Conference, but it is due to Ione and her brood of chicks that we shall berth upwards of 18 hours late. Some of the chicks flew around from Friday to Sunday at Force 8, causing what the Staff Purser described as a fairly rough sea with moderate swell (the latter estimated by ordinary people to be 40 to 50 footers). There have been in the circumstances remarkably few absentees, and those only for a couple of days. Faces pale and thoughtful were always ready to light up, and without doubt it has been a happy voyage in a ship of extreme comfort and luxury, with everything offered in the way of entertainment.

'Housie' or 'horse racing' takes place every evening followed by dancing, and the daily tote on the ship's run has been very popular. The run incidentally varied from 504 miles on Friday to 341 miles when the sea became 'moderate.' Sir Harold Smith gave a cocktail party one evening, as did the President and Members of the Council of the Institution. All the delegates have at one time or another been invited to cocktails by one of the ship's senior officers. The last dance featured a fancy headdress competition, and the fourteen entrants included six of our party. It is regrettable to have to record that Dr. Haffner's albatross attracted not only the first prize but Ione as well.

By courtesy of the Captain and staff, facilities were offered for visits to the engine rooms and kitchens; and many of us took the opportunity of seeing how cunningly a mass of machinery can be arranged in a comparatively confined space.

And so we near the end of the voyage, almost before we have stopped remarking that 'the hotel's rather hot today' or 'those people must just have arrived.' Of all the pictures stored in mind perhaps the most thrilling is that of the 'Queen Mary' overtaking us and passing us half-a-mile away on the port beam in a rack of rain and spray (Mr. Andrew remarking that she might have picked up one of our passengers who was in a hurry).

We (this time the editorial 'we') were somewhat huffed the other day. Remarking to our friend and contemporary that we were considering selling the 'JOURNAL' and going on the 'Caronia's' next world cruise, the 'G.W.' replied: 'Well, the proceeds should get you part of the way.'

It is 6.30 p.m., and landfall is reported.

INCREASE IN SUBSCRIPTION RATES AND SINGLE COPY PRICE.

We regret that continuing heavy rises in production costs and overheads compel us to increase our subscription rates as from October 1, 1955. The new annual advance subscription will be:—Home and Empire 60s.; Foreign 70s. The price of single copies will be 1s. 6d. (by post 1s. 8d.) as from that date.

The new rates will apply to existing subscribers when their current subscription expires.

Personal

MR. A. COLIN FIDDES, Technical Assistant at Aylestone Works, Leicester, who is leaving to take up a similar appointment at Carlisle, has been presented with a gold cigarette case. Mr. Fiddes joined the gas undertaking when he left school and has been at the Aylestone Works for 30 years. His father also worked there, and his grandfather and great grandfather were also connected with the gas industry.

MR. and MRS. CHARLES ROBERTS, of Shaw Estate, Newbury, have just celebrated their golden wedding. At 71, Mr. Roberts is still working at the Newbury Gasworks. They have two sons and two daughters, and seven grandchildren.

Correspondence

METHANE FOR ALL

DEAR SIR.—In the leading article, headed 'Liquid Methane for London?', in the current issue of the 'GAS JOURNAL,' you refer to the technical investigations which are being made by the North Thames Board and you say that 'It is hardly surprising that the London Boards should be more interested than others in the enormous possibilities of such a scheme.'

The Chairman of the Gas Council when he spoke at the first session of the Sales and Service Conference last Monday, the 12th September, made it clear that the investigations which the North Thames Board are conducting at the request of the Gas Council are being made on behalf of the gas industry as a whole.

Yours faithfully,
F. G. BREWER,
15/9/55 Secretary, The Gas Council.

Obituary

MR. PETER GOURLAY, who was the manager of the Markinch Gas Company for 25 years, has died at Kelty. He had a lifelong association with the gas industry and succeeded his father as manager of the Company. Later, when Markinch was merged with the Kirkcaldy District, he was transferred to Kelty. His passing will be regretted by his many friends in the Scottish Association of Gas Managers. Mr. Gourlay leaves a widow and two daughters.

MR. ARTHUR WATSON, Assistant Managing Director of the Stanton Ironworks Co., Ltd., died suddenly at Stanton on the morning of September 22 during the opening ceremony of the coke oven plant extension with which he had been so closely connected. He was in his 63rd year. Mr. Watson was born in Glasgow and educated at Glasgow High School and the Royal Technical College, Glasgow. He commenced his business career with a firm of coal masters, and later transferred to the Summerlee Iron Company. At the outbreak of the 1914 war, he joined the Glasgow Highlanders (9th H.L.I.), and, in 1915, was granted a commission in the Royal Artillery. He was demobilized in June, 1919, with the rank of Captain, and returned to his previous employment. In October of the same year he joined the Stanton Company. His first appointment at Stanton was in the Iron Pipe Department. From this he was moved to become personal assistant to the Commercial Manager, and later took charge of the Foundry Sales Department. In 1933 Mr. Watson was appointed Manager, Iron Pipe Department, and to these responsibilities added export in 1934. In July, 1940, he was made Assistant Managing Director.

MR. LEONARD LACEY, who retired in 1950 after 39 years service with the Gas Light and Coke Company and latterly the North Thames Gas Board, died at Tilford, Surrey, on September 22. Born in June, 1890, at Beckton, where his father, Mr. T. S. Lacey, was Engineer, he was educated at Merchant Taylors School and the City and Guilds Engineering College, graduating as B.SC.(ENG.) in London. He started his life in the gas industry as a staff pupil at Beckton in 1911, and served in the Royal Engineers during the first world war. After his demobilization he was appointed Junior Assistant Engineer at Fulham in 1919. He went to Bromley-by-Bow in 1922, Stratford in 1925, Harrow in 1927, and was at Kensal Green from 1932 to 1936. After seven years as Deputy Station Engineer at Nine Elms he was posted back to Harrow as Engineer in 1943, and remained there until his retirement in 1950. Mr. Lacey, who was a Past President of the London and Southern Junior Gas Association, was one of a long line to serve the gas industry with distinction. His brother, Mr. Stephen Lacey, was one of the chief officers of the Gas Light and Coke Company for many years prior to his death. The only remaining member of the family in the industry is Mr. A. D. Lacey, now at the headquarters of the South Eastern Gas Board at Croydon. Mr. Leonard Lacey, who was an accomplished pianist and organist, leaves a widow and a son and daughter.

Diary

September 29.—NORTH THAMES G.C.C.: Westminster City Hall, 2.30 p.m.

October 4.—SOUTH EASTERN G.C.C.: Caxton Hall, Westminster, S.W.1, 11 a.m.

October 5.—MIDLAND JUNIORS: Report on the Paris visit. Birmingham.

October 5.—INSTITUTE OF FUEL: 'Effect of Coal Quality on the Efficiency of a Shell Boiler Equipped with a Travelling-Grate Stoker,' E. J. MacDonald and M. V. Murray; Institution of Civil Engineers; Great George Street, S.W.1, 5.30 p.m.

October 6.—WALES AND MONMOUTHSHIRE SECTION, I.G.E.: Annual Meeting, South Wales Institute of Engineers, Cardiff; official luncheon, Park Hotel; visit to Nantgarw coke ovens.

October 8.—YORKSHIRE JUNIORS: Annual General Meeting, Bridge Street, Leeds, 2.30 p.m.

October 8.—SCOTTISH (EASTERN) JUNIORS: Visit to Dunfermline gasworks, followed by Presidential Address of J. C. Macdonald (Perth); Gas Showrooms, Dunfermline.

October 10.—NORTHERN G.C.C.: 30, Grainger Street, Newcastle-upon-Tyne, 11.15 a.m.

October 11.—MIDLAND JUNIORS: Presidential Address; Staff Mess Room, Council House, Birmingham.

October 14.—LONDON AND SOUTHERN JUNIORS: Presidential Address, N. R. Junkison, Edgware Road, 6.30 p.m.

October 14.—MIDLAND SECTION, I.G.E.: Autumn Meeting, Palace Hotel, Buxton, 11.0 a.m. Paper by H. Oliver and K. Carr: 'Some Observations on Refractories for Gas Retorts.'

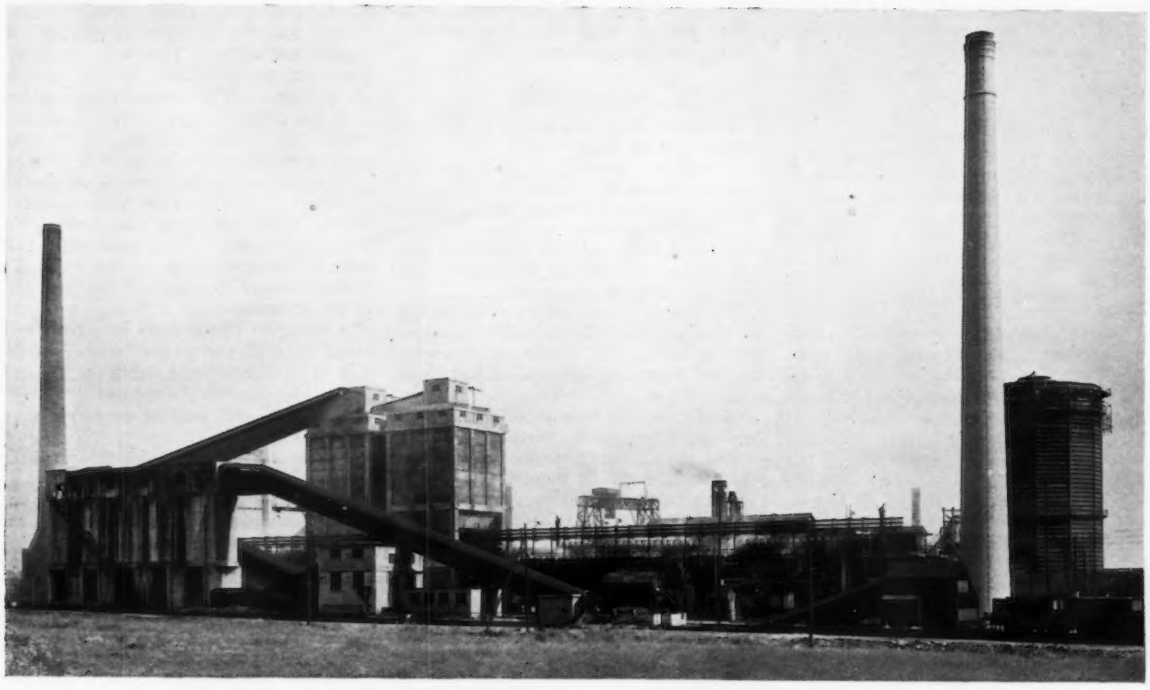
October 19.—LONDON AND COUNTIES COKE SALES CIRCLE: Visit to Beckton gasworks.

October 19.—SOUTH WESTERN SECTION, I.G.E.: Annual General Meeting, Swindon.

October 25.—EASTERN G.C.C.: Connaught Rooms, Great Queen Street, W.C.2, 11 a.m.

November 21. — WEST MIDLANDS G.C.C.: Committee Room, Gas Offices, Edmund Street, Birmingham, 3, 2.30 p.m.

Leadership in the Twentieth Century is the title of a series of five evening lecture-discussions to be held on successive Thursdays, from 6.30 to 8 p.m., starting November 17, at the Fyvie Hall of the Polytechnic, Regent Street, London, W.1. The series is intended as a once-a-year refresher contribution to the needs of practising managers, executives, and administrators.



Stanton coke oven plant showing blending bunkers, coal storage bunkers, battery and gasholder

Stanton Development Scheme

A description of the Stanton coke ovens and of the new extensions which were inaugurated on September 22, followed by a report of the ceremony.

THE first battery of Stanton coke ovens complete with all ancillaries came into production in 1940 and has operated continuously ever since. This battery of 41 ovens was designed so that at a future date the installation could be doubled. The new section comprising 44 ovens and additional ancillary plant is now in operation and the following is a brief description of the old and new installations.

The installation of a coke oven plant at Stanton marked an important change in the policy of the Company. Prior to the outbreak of the last war all the coke required by the blast furnaces at Stanton was purchased in the open market. The 41 ovens were planned to produce about one-half of the coke used at Stanton, leaving the other half still to be purchased together with all the coke used at the company's blast furnaces at Holwell and Wellingborough. The balance of coke oven gas, after using about 40% of the total make of gas for under-firing the coke ovens, was sold to Nottingham, Derby and Long Eaton.

After the war consideration was given to the doubling of the coke oven plant. The economics of this proposal depended largely on the use which could be made of the gas, and after full examination of all possible alternatives it was decided to combine the doubling of the coke oven plant with schemes for improving the efficiency of the blast-furnace plants at Stanton.

The most satisfactory method of obtaining maximum gas utilization at Stanton is to heat the coke ovens with clean blast-furnace gas and thereby release the whole of the rich coke oven gas for use by the East Midlands Gas Board. Previously the quantity of coke oven gas available for sale to the East Midlands Gas Board was about 6½ mill. cu.ft. per day. With the new scheme in full operation the quantity available to the gas board is about 24 mill. cu.ft. per day. The new scheme, therefore, in addition to the doubling of the coke oven plant, involved large extensions in connection with both of the blast-furnace plants at Stanton and in particular the cleaning of 192 mill. cu.ft. per day of blast-furnace gas.

Original Installation

The original coking installation, built at Stanton in 1939, consisted of a battery of 41 W-D Becker combination regenerative ovens designed to carbonize 860 tons of coal per day; coal-handling, blending and crushing plant; by-product recovery plant of the semi-direct type; crude benzole and rectification plant; steam-raising plant; and extensive railway sidings. Technical developments were later introduced, resulting in the throughput being increased to 960 tons of coal per day. In addition, gas purifiers, producers for dilution gas, gas drying plant and boosters were installed to handle 6½ mill. cu.ft. per day of gas sold to local gas undertakings. In 1949 a primary crusher was introduced into the system to enable run-of-mine and graded coal to be blended.

The layout of the coke ovens had been designed to allow for 100% extension at some future date. In 1951 it was decided to carry out this extension and at the same time to incorporate blast-furnace gas cleaning plants at the Company's two blast furnace plants. As a result, in 1954 the existing battery was changed over to blast-furnace gas under-firing. In addition to the new battery of ovens, new gas purification, drying and boosting plants were installed in place of the original plants, in order to deal with the extra coke-oven gas generated. It was also possible to use clean blast-furnace gas for the dilution to the specified calorific value (485 B.Th.U. per cu.ft.) of coke-oven gas, instead of the producer gas previously used. The new battery was

put into operation in April of 1955.

Coal for the plant is brought in by rail from the Nottinghamshire and Derbyshire, Yorkshire, Durham and Welsh coalfields. The handling plant (which has a capacity of 150 tons per hour, and was intended for washed slack only) was modified in 1949 by the inclusion of a British Jeffery Diamond primary crusher. This machine is of the Flextooth hammer mill type and reduces any run-of-mine or graded coal so that 95% passes through ½-in. square mesh.

The Oven Batteries

No. 1 battery, which was commissioned in 1940, consists of 41 W-D Becker combination regenerative ovens of the gas gun type, designed for heating either by coke oven or blast-furnace gas. The ovens are 40 ft. 8 in. long between doors, 12 ft. 6 in. high and 16 in. wide with a taper of 2 in. The capacity of each oven is 14.5 tons of coal with a moisture content of 9%. Until September, 1954, the ovens were under-fired by coke oven gas. After this date, clean blast-furnace gas was used as the fuel. The oven brickwork is mainly of high grade silica construction; the regenerator fillings of fireclay tiles and squares.

Each oven wall incorporates a series of vertical flues connected by crossover flues over the top of alternate ovens. Beneath each series of vertical flues and connected to them are two regenerators. The fuel gas main and supply pipes are located in galleries on either side of the battery. Beneath the galleries run the waste gas flues connecting the regenerator outlet boxes to the stack at the end of the battery. Suction in the flues is maintained constant by an Askania governor coupled to the main damper at the chimney base.

No. 2 battery, which consists of 44 W-D Becker combination regenerative ovens of similar construction to No. 1 battery, was commissioned in April, 1955. The latest modifications have been incorporated, the chief of which are the hammer-head design of oven wall bricks and the use of special fireclay blocks for the regenerator filling.

Ancillary Plant

A control room is situated at the coal bunker end of each battery. A reversing machine located in each of the control rooms is coupled by linkwork to the various gas and air supply valves of the respective batteries. Each machine is independently controlled, and operates at intervals of 30 minutes; the reversal times are staggered.

The coal is fed to the ovens by means of two Wellman Smith Owen charging cars of the portal type which traverse the full length of the top of both batteries. These cars receive their charge of coal from the bottom of the service bunkers, where it is weighed and recorded by means of a weighbridge which is under each bunker.

When carbonization is complete, the hot coke is discharged from the oven by means of the Wellman Smith Owen pusher machine into the coke quenching car. The combination coke pusher machines are arranged to travel the length of the two batteries, remove and replace the oven doors on the pusher side, level the charge of coal, and push out the hot coke. The pusher beams are of robust construction and are operated by rack and pinion. The beam of the machine supplied in 1955 is of lattice construction, to prevent distortion by cold winds. The leveller bars are of steel construction, and are driven by ropes. Each machine incorporates an air compressor and receiver, to supply air to the top of the pusher head for the removal of roof carbon. The hot coke discharged from the oven is led by means of the coke guide over the coke side platform into the coke quenching car. The coke quenching car is hauled by an electric locomotive. A diesel locomotive is available as a stand-by.

The loaded quenching car is taken to the quenching station, where a controlled quantity of water is sprayed on to the hot coke. The water draining from the coke car passes through settling ponds where any suspended breeze settles out; the water is then re-circulated for further use. The quenching station consists of a brick tower in which is located a series of sprays fed from a high-level tank. A breeze grab-and-hoist recovers breeze from the sump and delivers it into rail wagons. After quenching, the coke is unloaded from the car on to an inclined wharf in readiness for transfer to the screening plant.

A conveyor belt delivers coke from the wharf direct to the primary screen. This is a Gyrex single deck vibrating screen, which separates the blast-furnace coke—above 1¼ in.—for loading by boom conveyor into wagons.

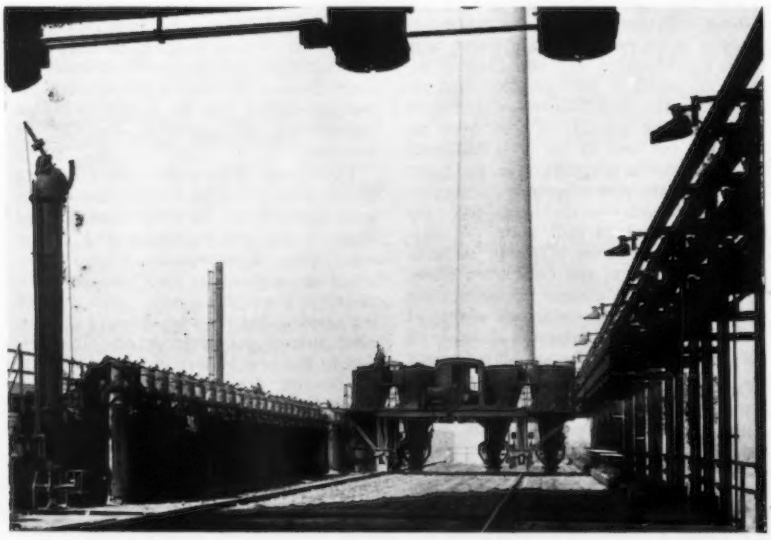
The undersize coke from the primary screen is delivered to a smaller Gyrex screen, where another sizing is made, at ¼ in. The oversize from this screen is sold as domestic coke nuts, and breeze passing through is used on the coke-oven boilers, or sold for steam-raising or sintering.

Gas Collecting System

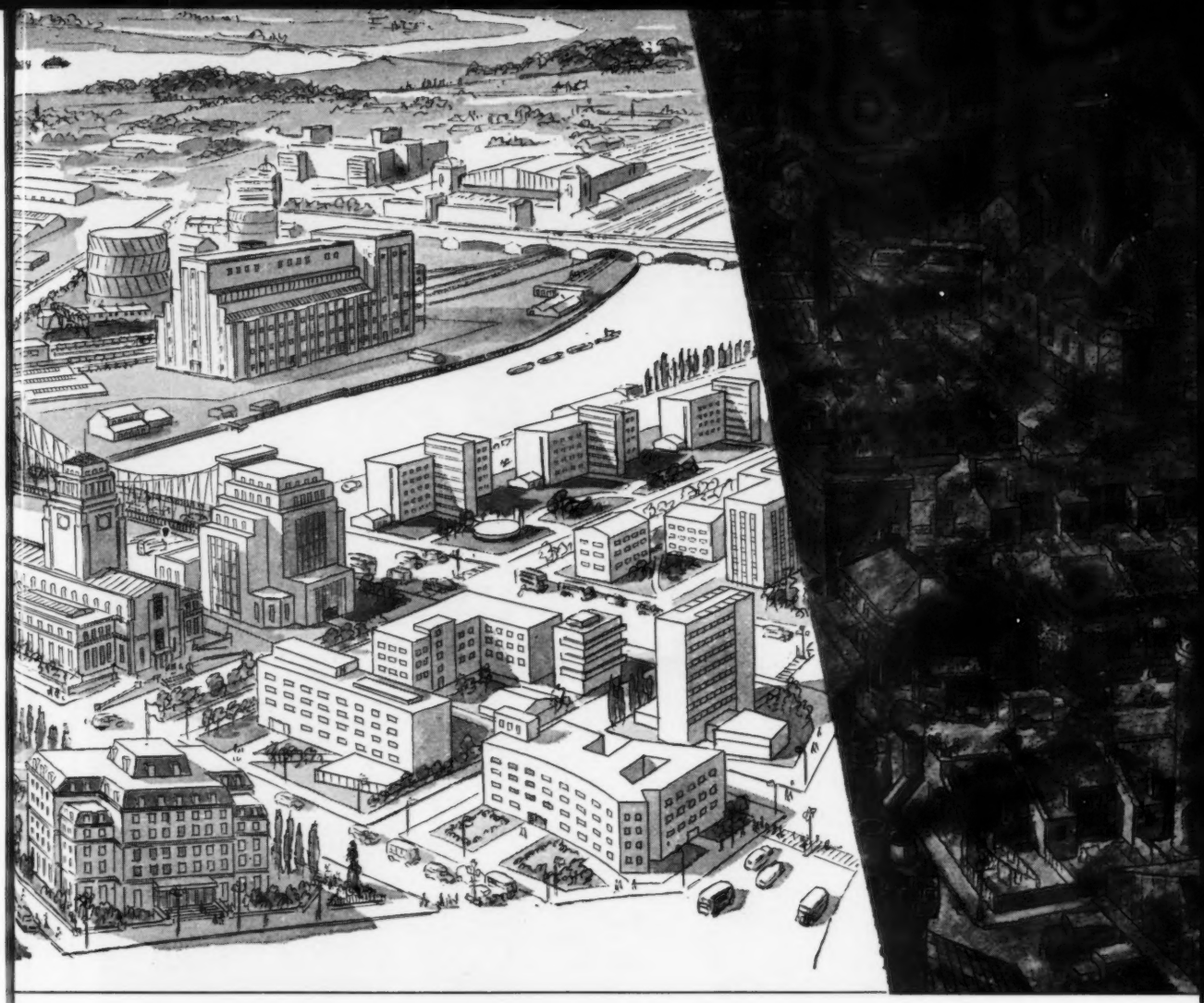
The gas streams from the old and new batteries are independent up to the benzole scrubber outlets. Crude gas passes from the ovens through ascension pipes on the coke side of the battery into a collecting main running the full length of the battery in the case of No. 1. Each of the two sections of No. 2 battery has its own collecting main. Gas in the collecting main is maintained at a constant pressure by an Askania regulator. Offtake mains, spanning the coke car track and by-product road, lead to the primary coolers. Downcomers conduct the condensed tar and ammonia liquor into the liquor flushing and separating tank. This is of the mechanically operated scraper type, two scraper conveyors removing the sludge continuously. Here, the tar separates from the ammonia liquor and overflows to a receiving tank from which it is pumped to storage before being eventually delivered to the ammonia stills for the recovery of the ammonia.

The gas from each battery is drawn through the offtake main to two primary coolers in parallel. A fifth cooler can be coupled into either circuit. Here, the gas is cooled to 30°C. The coolers are of the vertical water-tube type. From each set of primary coolers the gas is pumped by a B.T.H. exhauster to the electrostatic de-tarrers, where the last traces of tar are removed from the gas.

The exhausters (one is provided for each gas stream, with a third as stand-by) each of which has a capacity of 830,000 cu.ft. of gas per hour at 60°F. and 30 in. mercury against a back pressure of 3¼ lb. per sq. in., are of the centrifugal type. Each exhauster is direct-coupled to a steam-driven turbine operating at a steam pressure of 135 lb. per sq. in., and exhausting at 15 lb. per sq. in. back pressure. Each machine is controlled by an Askania governor operating a steam throttle valve through a Servo motor. The de-tarrers are of the Whessoe



Top of No. 2 battery showing the coal charging car and the ascension pipes



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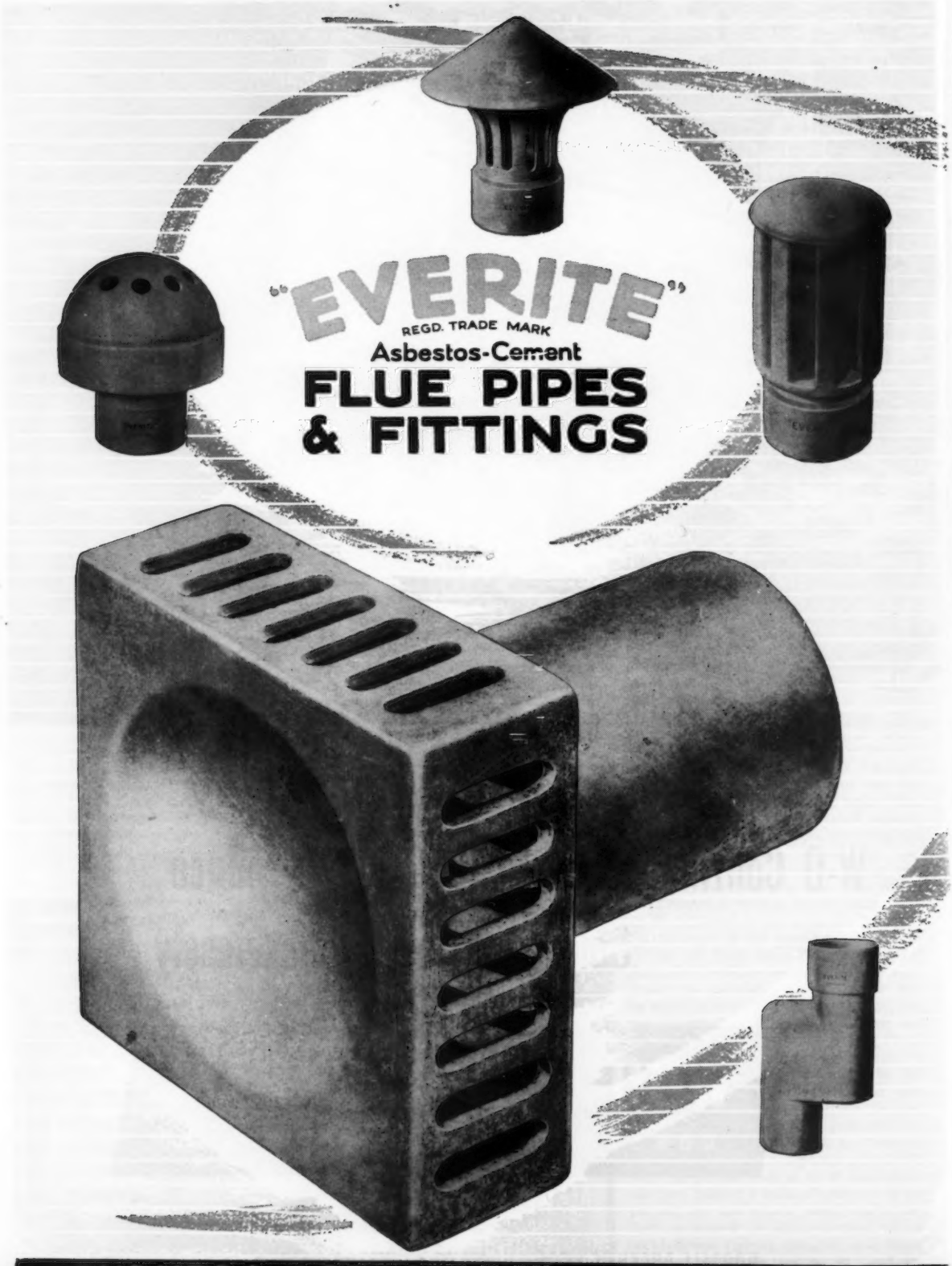

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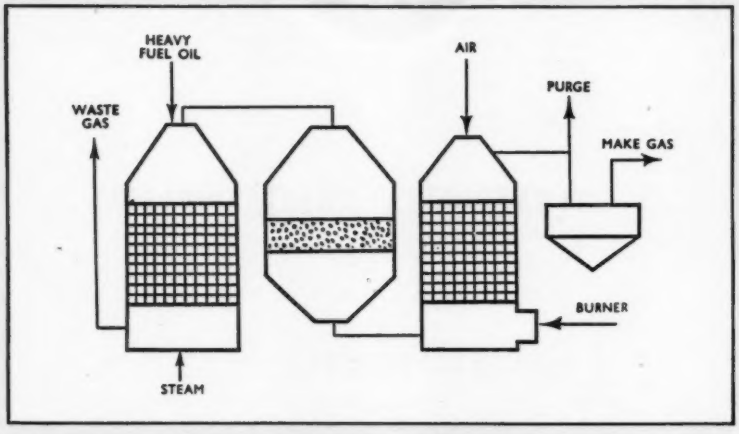
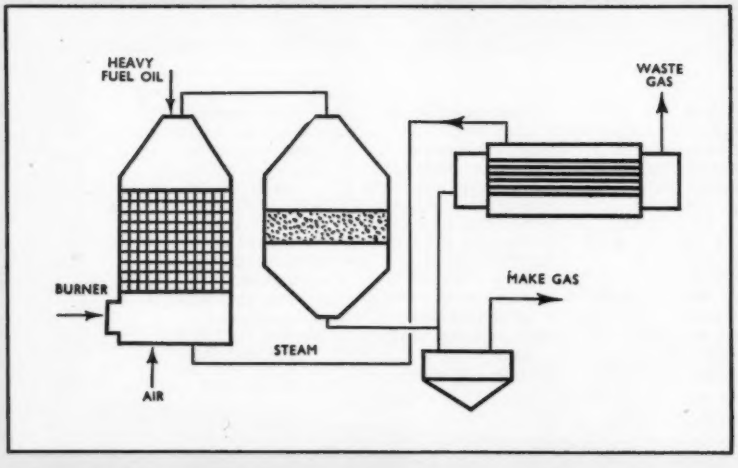


REGENERATIVE SYSTEM

The Humphreys-Glasgow Regenerative Onia-Gegi Catalytic Oil Gas Plant is currently producing 1.37 Therms of 450 B.Th.U. Town Gas per gallon of '1000 seconds' Heavy Fuel Oil and using its own Oil Gas Tar for heating.



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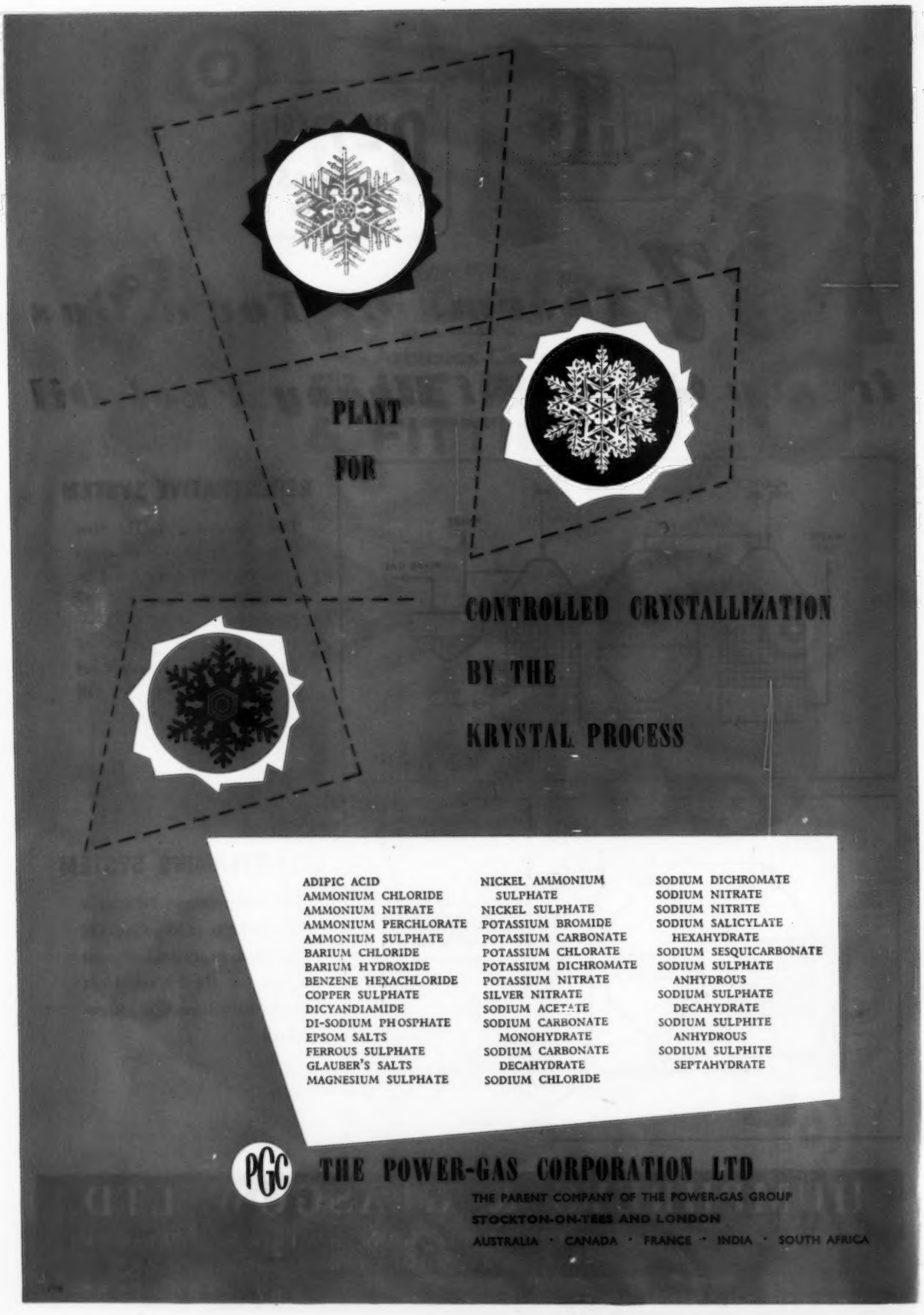

PLANT
FOR
CONTROLLED CRYSTALLIZATION
BY THE
KRYSTAL PROCESS
ADIPIC ACID
AMMONIUM CHLORIDE
AMMONIUM NITRATE
AMMONIUM PERCHLORATE
AMMONIUM SULPHATE
BARIUM CHLORIDE
BARIUM HYDROXIDE
BENZENE HEXACHLORIDE
COPPER SULPHATE
DICYANDIAMIDE
DI-SODIUM PHOSPHATE
EPSOM SALTS
FERROUS SULPHATE
GLAUBER'S SALTS
MAGNESIUM SULPHATE
NICKEL AMMONIUM SULPHATE
NICKEL SULPHATE
POTASSIUM BROMIDE
POTASSIUM CARBONATE
POTASSIUM CHLORATE
POTASSIUM DICHROMATE
POTASSIUM NITRATE
SILVER NITRATE
SODIUM ACETATE
SODIUM CARBONATE MONOHYDRATE
SODIUM CARBONATE DECAHYDRATE
SODIUM CHLORIDE
SODIUM DICHROMATE
SODIUM NITRATE
SODIUM NITRITE
SODIUM SALICYLATE HEXAHYDRATE
SODIUM SESQUICARBONATE
SODIUM SULPHATE ANHYDROUS
SODIUM SULPHATE DECAHYDRATE
SODIUM SULPHITE ANHYDROUS
SODIUM SULPHITE SEPTAHYDRATE
PGC
THE POWER-GAS CORPORATION LTD
THE PARENT COMPANY OF THE POWER-GAS GROUP
STOCKTON-ON-TEES AND LONDON
AUSTRALIA · CANADA · FRANCE · INDIA · SOUTH AFRICA

Woodall-Duckham vertical-tube and suspended-wire-electrode type. One pair in parallel is in circuit on each gas stream.

After leaving the de-tarrers, the gas passes through the reheaters where it is heated to about 65°C. On leaving the reheaters, the gas is joined by the ammonia vapour recovered in the ammonia-still from the liquor already referred to in the section dealing with the gas-collecting system. The gas enters the saturators and bubbles through sulphuric acid which combines with the ammonia in the gas, converting it to sulphate of ammonia. The gas is then led to the acid separators, where any entrained acid is removed.

Final Coolers

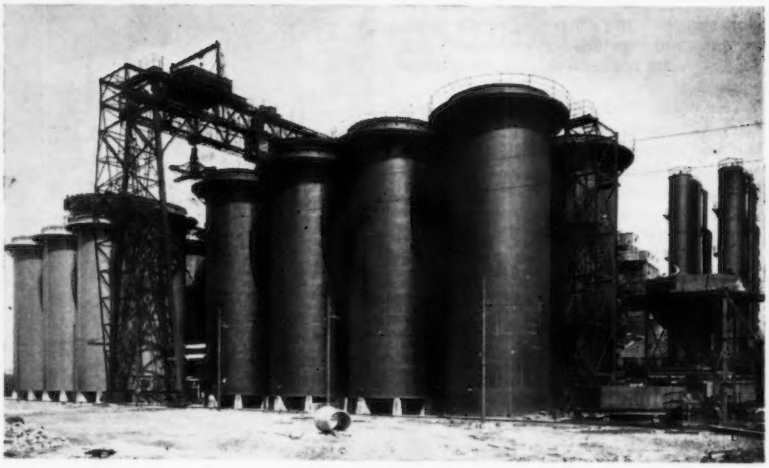
After leaving the acid separators, the gas (at a temperature of about 55°C.) passes to the final coolers before entering the scrubbers for benzole extraction. Each gas stream has one cooler. The final coolers consist of vertical cylindrical towers 80 ft. high, 8 ft. diameter, packed with wooden hurdles, where the ascending gas comes into direct contact with the descending cooling medium. In order to avoid atmospheric pollution by hydrogen sulphide, wash-oil in a closed circuit is used as the cooling liquid. The oil from each cooler is re-cooled in a range of twelve tubular oil-to-water heat exchangers in series, before being re-circulated.

From the final coolers, the gas in each stream passes through two benzole scrubbers in series, in counter-current with petroleum wash-oil. The scrubbers are vertical cylindrical towers 96 ft. high, 9 ft. diameter, packed with wooden hurdles, and each incorporates a receiving tank for benzolized oil in the shell at the bottom. The oil, enriched by benzole hydrocarbons absorbed from the gas, is pumped from the receiving tank to the crude benzole recovery plant.

Purification and Dilution

From the outlet of the benzole scrubbers, the gas enters a common main to the purifiers. The purification plant consists of two sets of W.C. Holmes type tower purifiers in parallel, each set being capable of the complete removal of hydrogen sulphide from 12 mill. cu.ft. of coke oven gas daily. Each set comprises six purifying towers, one sealed stocking tower and one stocking frame. Each working tower contains 15 steel baskets with wooden grids, each basket holding two layers of iron oxide contact mass. Three air blowers, one acting as stand-by, supply the air for the revivification of the purifying oxide. The purifiers are served by a 50-ton Stothert and Pitt Goliath crane.

When the oxide in any tower becomes spent, the tower is by-passed, purged with inert gas generated on site, and the lid removed. The containers are lifted out by means of the Goliath crane, and placed in the stocking tower, where they are kept in an atmosphere of inert gas to await emptying and re-filling with new oxide. The containers of fresh oxide in the stocking frame are then transferred to the working tower, which is then immediately purged and put back into the purifying stream.



Tower purifier installation for complete removal of hydrogen sulphide from gas.

To reduce the calorific value of the purified gas to the value specified by the gas board, blast-furnace gas is added via a rapid-mixing chamber.

After dilution the gas passes into a 500,000 cu.ft. capacity M.A.N. waterless gasholder. In addition to acting as a pressure governor, the holder functions as an additional mixer and smooths out the peaks in the calorific value.

The gas-boosting plant for delivering gas into the gas board's main comprises two electrically-driven Waller compressors, each of 10 mill. cu.ft. per day capacity against a back pressure of 25 lb. per sq. in., and two steam-driven Waller compressors, each of 8 mill. cu.ft. per day capacity. Normally three are in use, with one as stand-by. Three Connersville meters for measuring the volume of gas delivered, each with a capacity of 8 mill. cu.ft. per day, are located in parallel on the inlet side of the boosters.

On leaving the boosters, the compressed gas passes through a drying plant where its dew point is reduced to a level where there is no danger of water being condensed and deposited in the gas grid mains.

The wash-oil from the benzole scrubbers enriched with benzole, is passed through two vertical-tube vapour-to-oil heat exchangers, where it is heated to about 70°C. The oil is then further heated to about 130°C. by means of closed steam in a final heater, before entering the wash-oil still. Each of the two stills (which are five feet in diameter and of cast iron) has a series of 14 trays where the benzole is removed from the descending wash-oil by intimate contact with open steam admitted at the bottom of the still. The hot stripped oil from the still is pumped through wash-oil coolers before re-cirulation to the scrubbers. The coolers are of the open rack type over which the cooling water flows.

The wash-oil in circulation is kept in good condition by bleeding-off a quantity continuously and passing it through the Clayton oil regeneration plants. These are gas-heated stills in which the clean, lower-boiling fraction of the oil is distilled off and returned to the wash-oil circulation system after being condensed. The residue, which contains the sludge, is transferred to the coal blending plant for oiling the coal. The crude benzole vapour from the wash-oils is condensed by passing through the vapour-oil heat exchangers and coolers, and is delivered into a separator where the crude benzole is separated from the water and run to a storage tank. The crude benzole is pumped from the storage tank to the Barbet stills, where carbon bisulphide is removed by fractionation.

All cooling water is returned and re-circulated, the make-up for evaporation and loss being supplied from the canal. The make-up water is treated to remove the temporary hardness in two Permutit lime softeners. The water in the main system is cooled in a four-cell Fluor induced-draught cooling tower capable of cooling 240,000 gal. per hour to a temperature of 72°F. Two subsidiary cooling towers of the same make are used for the water from the steam-driven booster condensing system and from the gas after-coolers.

Approximately half the steam required for the plant is generated in two Babcock & Wilcox boilers with chain grate stokers burning coke breeze. Normally, one is in use.

New Booster Plant

The new high pressure boiler plant consists of three Babcock & Wilcox integral furnace type boilers, designed for working on clean blast furnace gas or oil fuel as required. The evaporation at maximum continuous rating is 70,000 lb. per hr. per boiler with a superheater outlet pressure of 450 lb. per sq. in. The final steam temperature when operating at M.C.R. on blast furnace gas is 760°F. with a feed temperature at the economizer inlet of 220°F.

Feed water evaporators were supplied by Aiton and Co., Ltd., and consist of three triple effect evaporators each capable of producing 20,000 lb. per hour of distilled water make-up when supplied with live steam at 450 lb. per sq. in 760°F. They are of the low pressure

vertical straight tube type, arranged for working on the vapour compression system and include raw water pre-heaters, vent condensers and blow-down coolers.

The boiler feed pumps consist of two Harland electrically-driven and one Harland steam-driven boiler feed pumps, each capable of delivering 200,000 lb. per hr. at a delivery pressure of 600 lb. per sq. in.

Each boiler is equipped with four 'Gako' type gas burners, each group having a combined capacity of 1,170,000 cu.ft. per hr. with gas at 60°F., and a pressure of 5 in. w.g. The burners have a combined air capacity of 1,220,000 cu.ft. per min. at 80°F. Also each boiler is equipped with four liquid fuel tubes, suitable for firing through the centre of the 'Gako' blast furnace gas burners and consisting of steam atomizing oil sprays.

The additions to the new works power plant consist of two new Parsons turbo blowers and one new 6,000 kW turbo alternator. The turbine plant is provided with a battery of mechanically induced draught cooling towers circulating 640,000 gal. per hr. of cooling water with a cooling range from 88° to 75°F. at a wet bulb temperature of 60°F.

In addition to the two new blowers, which are of suitable capacity for dealing with the maximum anticipated Stanton blast furnace diameter, two of the older machines have been reconstructed for increased output to meet similar conditions.

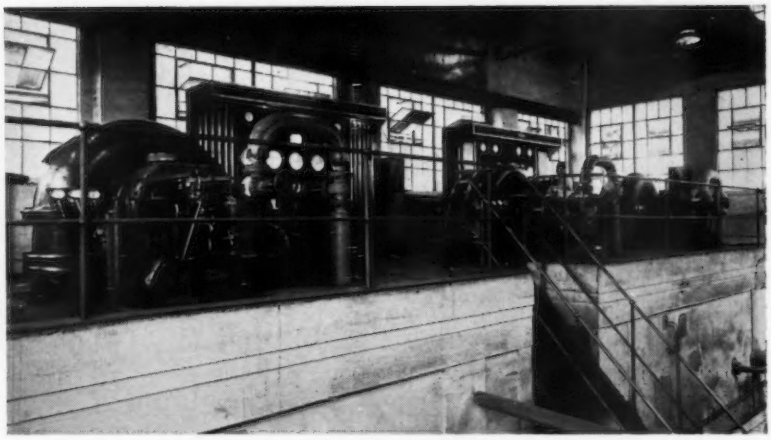
The inclusion of the 6,000 kW turbo alternator is to meet the increased works electrical load, resulting from the major development plant inclusions, and has replaced the previously operated 2,000 kW and 1,500 kW generating sets.

Gas Cleaning Plants

Gas cleaning plants consist of one three-unit plant at the new works furnaces and one two-unit plant at the old works furnaces, both supplied by Lodge-Cottrell & Co., Ltd. Since both plants are of similar design a description of that at the new works will serve to cover the general particulars. The new works plant, which serves three blast furnaces, consists of Lodge-Cottrell single stage wet electro-filter units with a total capacity of 6.6 mill. cu.ft. per hr., designed to clean from 5.0 to 0.005 grains per cu.ft.

The gas cleaning plant proper consists of three separate units, and each unit comprises a water scrubbing and cooling tower followed by an electro-filter with inter-connecting gas mains and isolating valves. In addition there are further by-pass mains and valves to enable any tower or filter unit to be laid off individually without shutting down the entire plant. On the outlet side of each treater an electrically-operated turn damper is provided to enable the operator to adjust the gas flow through each of the three electro-filter units as indicated by the gas flow meters provided. This damper is push-button controlled and can be quickly closed in an emergency.

Both the Stanton blast furnace plants and the coke ovens have been connected by a system of overhead services supported throughout on steel trestles.



A view of the turbo-exhausters at Stanton.

These comprise the blast furnace gas mains, the steam and condensate supply mains and the high tension electrical distribution system.

The blast furnace gas mains are of 5 ft. 6 in. diameter throughout and have a tapping to the blast furnace gasholder at the inter-connecting point.

The normal consumption of blast furnace gas at the coke ovens is roughly 2 mill. cu.ft. per hr. of which approximately 1½ mill. cu.ft. of gas comes from the new works furnaces and ½ mill. cu.ft. from the old works furnaces.

Blast furnace reconstruction has included new bosh and hearth shells to obtain a maximum diameter within the existing furnace columns. In addition, at the old works plant, the hearth and bosh linings are being reduced in thickness as a result of carbon refractory substitution. In due course it is expected that all the Stanton furnaces will be constructed on similar lines.

Blast Furnace Gasholder

The blast furnace gasholder has a capacity of 2 mill. cu.ft. and was supplied by Robert Dempster & Sons, Ltd. The holder is of the waterless (M.A.N.) design, 124 ft. across the inside corners—190 ft. high. It is a 20-sided polygon, designed for storing blast furnace gas, with a minimum pressure of 10 in. w.g.

It has one common 42 in. diameter inlet and outlet pipe complete with double 'U' type seals and a motorized valve. There are four external galleries with auxiliary staircases giving full access to the roof in addition to one 10-cwt. external passenger lift and one 5-cwt. internal passenger hoist.

Control of the piston sealant is from ten pump units located in houses around the base of the holder.

Hot Blast Stoves

Reconstruction of the hot blast stoves has constituted a major section of the development programme. Under the old arrangement there were 24 stoves operating on dirty blast furnace gas and serving the five Stanton blast furnaces. These were all of the open chequer type and were supplied direct from the furnace dust-catchers via the dirty gas main; the estimated consumption of gas under these conditions was of the order of 40% of the total gas make.

As reconstructed, nine of the old stoves have been taken out and of the remainder six have been entirely re-built with new shells, five have been re-lined completely and four partially re-lined. The stoves are now close chequered, are fired with clean blast furnace gas and are equipped with Askania regulated pressure type burners and Integra dome temperature control. The above conversion has resulted in the stove gas consumption being cut down to approximately one-half of that on dirty gas.

The stove burners are of Freyn constant speed design, and consist of a burner box, a motor-driven blower fitted with an automatically operated air control damper and a combustion controller for regulating the air flow in accordance with the gas flow.

Finally, the extension to the new works pig casting plant consists of a casting machine of Ashmore, Benson stationary wheel double strand type; a ladle-tilting crane of Wellman, Smith Owen manufacture with a capacity of 20 tons; and a Butterley E.O.T. pig loading crane of 7½ tons capacity and 25 ft. span, operating on a common gantry with the original crane.

THE INAUGURATION CEREMONY

On Thursday, September 22, a large gathering witnessed the inauguration by Mr. Geoffrey Lloyd, Minister of Fuel and Power, of the extensions to the new coking plant described in earlier paragraphs. Representatives of the iron and steel industry, the National Coal Board, the gas industry, the Ministry of Fuel and Power and the contractors, as well as the B.B.C. and the national and technical Press, saw Mr. Lloyd depress a button which caused the coke discharging machine to push an oven. After this ceremony the guests split into separate groups for a short tour of the plant. At this point a tragic event occurred in the sudden death on the site of Mr. Arthur Watson, Assistant

(*Concluded on page 821*)

Alternative Methods of Gasmaking*

By W. A. EVETTS, M.C., M.Inst.Gas E.†

THE district sections of the Institution of Gas Engineers comprise engineers having wide interests and responsibilities and it is right that our papers should seek to cover the various fields in which we are engaged. The sections are an important part of the Institution and the contributions to our technical knowledge made by them reach a high standard. The meetings, being less formal than those of our parent body, give an opportunity for discussion which would otherwise be lacking. I have been privileged to be your representative on the Council of the Institution during my year as Chairman and I have been impressed with the efficient way in which the whole work of our Institution is conducted. The great attention which is given to all aspects of the work of the Institution by the members of the Council ensures that the increasingly higher standards demanded of all engaged on the engineering side of our industry will be maintained and advanced. We should not forget the fine work carried out by the Committees appointed by the Council, such as the Education Committee, the Safety Rules Committee, Pipes Committee, etc. We are greatly indebted to those members of our Institution who willingly give up much of their leisure time for the benefit of our profession.

The gas industry is competing with many other industries for young men educated in the sciences and the success of the industry in the future will largely depend on the calibre of the men responsible for its conduct. When one reflects on the complex problems facing us today, it would appear inevitable that specialization will become more and more necessary and this is apparent in all branches of industry. Specialization has its advantages and its problems. It should open up our industry to young civil, mechanical, and chemical engineers who need not necessarily remain in the gas industry all their working life. We should have a wider field to draw on and at the same time the individual would feel that his experience in the gas industry enabled him to pursue a career in other branches of industry should he wish to do so. The revised Education Regulations of the Institution should make this easier of attainment than would have been the case previously.

Effects of Specialization

We are told that one of the disadvantages of too much specialization is that it provides no opportunity for experience in administration. I am sure, therefore, that many welcomed the courses in management which the Institution inaugurated two years ago at Brooklands Technical College, which were made possible through the generosity of the Woodall-Duckham Company. These courses have been continued by the Gas Council and altogether six courses lasting six to seven weeks have been held.

I was happy to have been asked to lecture at four of these courses and to meet some of the capable and enthusiastic young men in our industry, in whose hands the future will lie. What I think was important and valuable to the students was that they were able to discuss with each other the many problems and aspects of industry and life in general and have the time for reflection, which is so often denied to us, when we are working under fairly considerable pressure. It is perhaps one of the worst features of our modern life that we have so little time for reflection and taking stock.

Management would appear to be partly an art and partly a science, if these two opposing activities can be associated. My dictionary describes science as knowledge systematized, truth ascertained, and art as practical skill guided by rules. Perhaps the art of management therefore is knowing when to apply science and when to apply art to your problems. One thing is certain, that science must take account of economics. We all realize more and more that it is an aspect that we cannot neglect. It is a great stimulant and it forces us to probe our problems and processes carefully. We hear much about increased productivity today and this, after all, means a careful examination of what we are doing with a view to improving our processes to make them more economical. The capacity to think in detail is one which must be cultivated.

Industry Subject to Criticism

As a nationalised industry, we are subject to a good deal of ill-informed or misinformed criticism. This perhaps is natural and something that we have to endure. Ours is a complex industry and to a certain extent we can forgive the public for focusing their attention only on what they have to endure in terms of increased prices, without being able to assess what has been achieved. We in the industry will say in answer to such criticism that gas is one of the very few commodities that is costing about twice its pre-war price, but which is produced from materials and labour costing three or more times their pre-war cost. That is the position, as we know, in many parts of the country.

In an endeavour to show how far this is true in the organization which I serve, I have made a comparison between costs of production, distribution, etc., which obtained in the former Watford and St. Albans Gas Company in 1939 and 1948, and those incurred in the Watford Division of the Eastern Gas Board in 1954-55 and in each case I have shown the overall revenue per therm. Although I am not strictly comparing like with like, the figures are, I think, sufficiently so to make the comparison acceptable.

The following table gives a comparison between the years:—

Pence per therm of gas sold

	1939	1948	% of 1939 cost	1954-55	% of 1939 cost
Raw materials	5.66	12.36	218	17.84	315
Less by-products	3.54	7.15	202	10.33	292
Net raw materials	2.12	5.21	246	7.51	354
Manufacturing charges including repairs and maintenance	1.87	2.60	139	3.34	178
Cost of manufacture	3.99	7.81	196	10.85	272
Distribution and consumer service (net)	0.44	0.94	214	1.91	434
Administration, rates, welfare, and general charges	1.90	1.67	88	2.18	115
	6.33	10.42	165	14.94	236
Depreciation and renewals, dividend and interest	3.16	2.80	89	3.28	104
Total	9.49	13.22	139	18.22	192
Total receipts for gas	9.50	13.29	140	18.90	199
Surplus	0.01	0.07		0.68	
Capital expenditure per mill. cu. ft. sold	£982	£700		£758	

Taking 1939 costs throughout as 100, it will be seen that raw materials in 1954-55 were 315, whereas receipts from by-products were only 292, with the result that net raw materials are 354, or more than 3½ times the 1939 cost. Other manufacturing costs have been held at 178 and the total cost of manufacture 272. The total cost of making and distributing gas, including interest and depreciation, is 192.

Significant Figures

There is undoubtedly some little difference in the build up of the various charges between the two years, but not sufficient to affect the general trend. What is significant is that whereas net raw materials have increased by 254%, all other charges including interest and depreciation have only increased by 45% from 7.37d. to 10.71d. per therm, in spite of heavy increases in labour and materials.

To attempt to explain these results would require a much more detailed investigation, but a greatly expanded load, increased productivity of both labour and plant, have all contributed. No doubt the figures are typical of what has been taking place throughout the industry. Our claim that the

* From the Chairman's Address at the annual meeting of the Eastern Section of the Institution of Gas Engineers at Sheringham, September 20.

† Divisional Engineer, Watford Division, Eastern Gas Board.

price of our main commodity is costing about twice its pre-war cost can therefore be substantiated.

In 1939 the cost of net raw materials was 37½% of the gross cost and in 1948 and 1954-55 42½%. In the latter two years 19% and 9% of carburetted water gas was made, whereas in 1939 only 0.35% was produced and this difference accounts for much of the percentage increase in the cost of net raw materials.

In the Watford Division the cost ratio of coal and coke is approximately one, and provided this ratio holds, 40% of any increase in coal costs will be borne by gas and 60% by coke and other residual products. For each £1 increase in coal or freight charges, gas will bear 8s. or about 1.28d. per therm. On the other hand, the capital charges incurred in installing carbonizing plant are all debited to gas and if the industry is to be asked to increase the production of coke for the domestic market, it would seem equitable for these charges to be borne at least equally by gas and coke.

Steady Fall in Consumption

In spite of not unsuccessful efforts the gas industry has made to hold down the selling price of gas, one can detect at times a slight note of despondency regarding our prospects of increasing sales of gas particularly to the domestic consumer. Since the war there has been a steady fall in consumption. In the Watford Division the average consumption of the domestic consumer in 1950 was 137 therms and in 1953/4, 127 therms, a drop of 10 therms. This is in line with the national average drop of nine therms as set out by Horsfall in his paper 'Some Trends and Influences on Domestic Load' to the Institution of Gas Engineers in 1955. Is this a problem peculiar to the gas industry? Are we fighting a losing battle?

A famous general is said to have declared when things looked rather grim on his side, that he took some comfort from thinking that the opposing general also had his problems. How are our main competitors faring? We all acknowledge the high calibre of our friends in the electricity industry. They have made great strides in recent years. Year by year they are increasing the average efficiency of their generating plant and the grid which covers the country from end to end is now being reinforced by a new super grid to operate at 275,000 volts. Their ability to bring London to the aid of Glasgow excites our admiration and we envy them their greatly expanding load. The first atomic power station at Calder Hall will shortly be in operation and others are planned. Almost anything to do with electricity is news today.

Electricity's Rosy Glow

It is perhaps natural that the gas engineer should, in his weaker moments, tend to picture the electricity industry framed in a rosy glow. On the other hand we can be sure they have their problems. Capital costs are very high; development is costing them about £150 per kilowatt and depreciation and interest amount to 10.4d. per equivalent therm sold and account for 25½% of the total expenditure on revenue account. Their load factor is falling. According to the Central Electricity Authority report and accounts for the year 1953/4 it has fallen from 47.1 in 1951/2 to 44.7 in 1952/3 and 43.9 in 1953/4. The cost of coal is rising year by year and of course the full 100% of this increase is borne by the 51.5 therms of electricity sold per ton of coal used. Rather surprisingly the average consumption of the domestic consumer, which although it has more than doubled since 1938, has shown a slight drop in the last two years, notwithstanding the fact that the price, taking the country as a whole, is about the same as pre-war. This is shown by the following figures:—

	1938	1951-52	1952-53	1953-54
Average consumption per domestic consumer, units	615	1,352	1,335	1,324
Consumption in therms ..	21.2	46.6	46.0	45.7
Average price per unit (pence)	1.522	1.353	1.452	1.532

The ability of the industry to sell electricity to the domestic consumer at the same price as in 1938 is a considerable achievement. It is apparent, however, that there has been a fairly complete revision of the tariff structure. In 1938 the average cost of electricity to industry was 0.646d. per unit and in 1954 1.143d. per unit. This revised structure has undoubtedly been one of the means by which the price to the domestic consumer has been held. It would almost appear that before the war the domestic consumer was subsidising industry whereas that is no longer the case today. In latter years the domestic and industrial tariffs have increased at almost a flat rate.

A Passing Phase

The tendency for consumption per domestic consumer to drop may be a passing phase and some of the factors which have brought about a reduction in gas consumption may have operated. Possibly the average domestic consumer is using all the electricity he is prepared to pay for and is tending to change his spending habits. The May issue of *The Times Review of Industry* contains an interesting article dealing with these changes caused partly by movements in the price relationship of products and partly by the ending of rationing and controls, which the writer of the article states have both raised problems for retail traders. According to this article, total consumer expenditure in 1954 was £2,417 mill. higher than in 1950 and 45% of this additional expenditure went on food. Expenditure on fuel and light in 1950 was £353 mill. or 3.8% of the total and in 1954 £487 mill. or 4.2% of the total. The writer of the article in reducing these figures to 1948 prices shows that the equivalent expenditure on fuel and light in 1954 was 8.3% greater than 1950.

New Dwellings

Nearly 1 mill. new dwellings have been built during these four years, an increase of probably 6-7% in the number of houses occupied, which may well account for the greater part of the 8% increase in expenditure. If this assumption can be accepted we can say that the consumption of fuel and light per dwelling has changed but very little since 1950. It is interesting to analyze how the expenditure of £487 mill. on fuel and light in 1954 is made up. By extracting figures from the British Electricity Authority and the Gas Council Reports for 1953/4 we can broadly set out the expenditure under the following headings:—

	Revenue from Domestic Consumers £mill.
Electricity	113.4
Gas	104.6
Total	218.0
Other fuels	269.0
Total expenditure	487.0

Space Heating Load

The amount spent by domestic consumers on other fuels—*i.e.*, coal, coke, etc., is greater than the combined expenditure on gas and electricity. This would indicate that there is still a considerable field for gas and electricity if it can be captured from the solid fuel market. Whether either or both industries wish to do so is, of course, another matter as the greater part of the solid fuel used is presumably for space heating. It is doubtful if the electricity industry with its falling load factor is anxious to extend its space heating load.

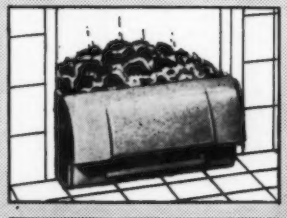
It would be foolish to make too much of our competitors' problems or to suggest that we can be complacent about our own, but an attempt to assess the one may assist in keeping the other in proper perspective. So far as the domestic consumer is concerned both are faced with the changing habits of the consumer and rising costs. It is sad to contemplate that economists no longer propose methods for stabilizing costs, but discuss the rate at which inflation will creep.

The changing fuel situation in the world is not without its effect on our own industry, although we have no indigenous sources of oil and natural gas. We are continually being reminded that supplies of traditional gasmaking coals are likely to fall besides becoming more difficult and expensive to win. We are therefore focusing our attention on alternative ways of making gas from heavy fuel oil, liquid petroleum gases, and the lower ranking coals. At the moment the picture is a little confused by the Beaver Report and it would appear that we must to some extent re-cast our plans for gas making, if we are to produce more coke and carbonize coal now being supplied to the domestic market.

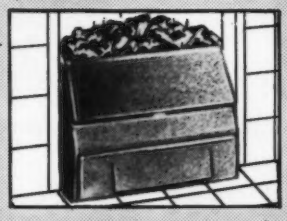
The erection of plants for the production of gas from heavy

THE No. 50 LOWBURN THRIVES ON COKE

A well designed, gas ignited fire with boiler flue set



Standard



Trivet

GOOD LOOKS AND LOW COSTS

People like the specially low front of this fire. It looks elegant, and because its front is two inches lower than the average continuous burning fire of this type, the heat rises from a lower level and so makes the whole room warmer. The low front has another advantage: it takes only a little fuel to make up a warm, glowing fire.

The Lowburn is most economical to buy, to install and to run. It is an approved appliance, burns without attention for 10 hours on gas coke—and other recommended fuels. It is made in a wide variety of attractive colours.

Built-in gas ignition burner available for left or right-hand or concealed supply.

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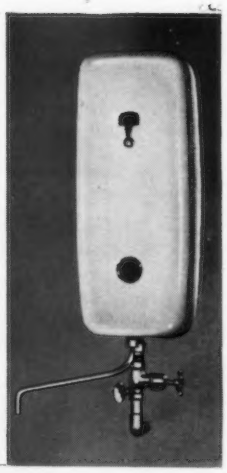

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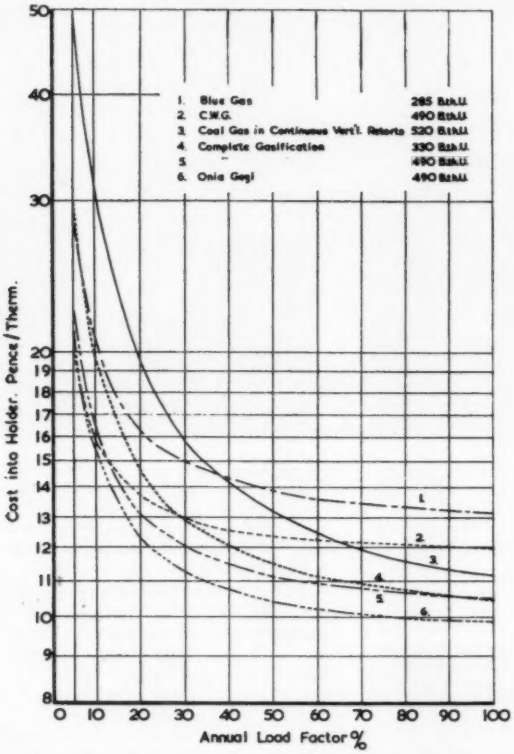
oil by thermal cracking, with or without the presence of catalysts, is taking place throughout the country though the contribution that these plants will make to the total gas demand is likely to be small for some time and the demand on the available diesel and fuel oils is increasing. The complete gasification of weakly caking coals at low pressure is being successfully carried out on the Continent and at least two plants embodying the two stage process are being constructed in this country, one at the Kensal Green works of the North Thames Gas Board and the other at the Watford works of the Eastern Gas Board. Experiments in complete gasification at high pressures, by the Lurgi process, are being vigorously pursued by the Gas Council's research staff at Birmingham, and if, as we all hope, these experiments result in the process producing gas economically, the range of coals which can be used for gas making will be greatly extended.

An Attractive Process

The recent heavy increase in the price of coal following a fairly substantial increase in rail freights and the inevitable rise in the price of coke makes the catalytic cracking of heavy oil an attractive process with the prices prevailing at Watford.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5. " 490 B.th.u.
6. Onia Gegi 490 B.th.u.
Cost into Holder. Pence/Therm.
Annual Load Factor %

Estimated production costs at Watford by various gas-making processes; costs include capital charges and are based on the following material prices: Coal for C.V. retorts, 115s. 8d. per ton; coal for complete gasification, 103s. 1d. per ton; coke for C.W.G., 130s. per ton; coke for sale, 130s. per ton; gas oil, 12.5d. per gal.; fuel oil (950 sec.), 8.625d. per gal.

A series of single line curves indicates the cost of producing gas by various processes, at annual load factors of from 5% to 100%. We are all familiar with these single line curves and our only difficulty has been to keep them up to date with the continuing rise in prices. They include capital charges and are therefore only of use when new plant is under consideration. They are based on today's prices of raw materials.

A New Relationship

For the first time in my experience, the higher the calorific value of carburetted water gas, the cheaper the gas. The complete gasification process shows up quite well at about 1d. a therm cheaper than coal gas, at an 80% load factor. The difference of about 1.75d. a therm between the cost of coal gas and gas produced by the ONIA-GEGI process, at 80% load factor, provides some food for thought. If we can be confident that the price of oil will remain the same or that the relative prices of coal and oil will not vary materially, all our new plant should be of the type to make gas by the catalytic cracking of heavy oil.

We are given to understand that the oil which the British Electricity Authority has contracted to buy is a 'topped crude' —*i.e.*, crude oil from which the gas and very light fractions have been removed, when presumably the flash point of the oil is reduced to enable it to be handled safely. This would appear to be a suitable oil for the catalytic process, being free of the cracked products which are included in the fuel oil we purchase today. We learn that the South Eastern Gas Board are proposing to make very large quantities of gas from the various products which will be available from one of the oil refineries on the Thames Estuary, but we know no details of the proposals. There would appear to be no reason today why we should not consider the erection of gasmaking stations producing gas entirely from 'topped crude' or heavy oil, working as base load stations, completely mechanized and employing small labour forces. Such a course can hardly be reconciled with the demand for more coke. Except in so far as oil gas is substituted for carburetted water gas, the process adds nothing to our coke supplies.

Coke No Longer a Cheap Fuel

At 164s. a ton, the delivered price of coke to domestic consumers in Watford, a therm produced from coke at 100% efficiency will cost 7.35d. and at 40% efficiency, which is approximately that obtained from the new coke fires, 18.4d. a therm. The price of gas in Watford on the two-part tariff comprises a fixed charge of 26s. a quarter, with a commodity charge of 16.675d. a therm. The cost of a useful therm from a flueless heater operating at 99% efficiency would be 18.5d. a therm, neglecting the standing charge which we are accustomed to do when considering an electric heater. It would appear therefore that we have arrived at the position where it is as cheap to space heat by gas with a flueless heater as with coke in a modern coke grate.

Coke is too valuable to be used for heating retorts, when we are producing large quantities of breeze, almost enough to heat our carbonizing plants, and which we dispose of at about 50s. a ton, equivalent to approximately 2.5d. a therm. The substitution of breeze for coke would add nearly 10% to our coke supplies and on fuel cost, reduce the price of coal gas by nearly 1d. a therm. It is a problem worthy of much more attention than it has hitherto received. If we are to continue to use coke in retort house producers should we not examine again the problem of equipping continuous vertical retorts with recuperators?

Tar Valued Too Cheaply

Tar is another product which is valued too cheaply. In the last financial year we received at Watford 6.9d. a gal. for tar, about 8.3d. a therm. If we use all available breeze to heat our carbonizing plants and require additional steam, it will certainly be very much cheaper to fire boilers with tar than use coke, in fact it can probably compete with breeze if we make allowance for the reduced labour requirements and the higher efficiency with which tar can be burnt.

If we are to install new carbonizing plant primarily to produce additional coke required to implement the Beaver Report, we must ensure that the process can compete with the alternative methods of gas making which are at our disposal today. There is much that can be done to produce gas more efficiently and economically if we pick our present methods to pieces and make a fresh appraisal in the light of new techniques and present day costs of materials and labour.

The transactions of our parent body and the papers read at the various sections are so comprehensive that there is no need for any of us to be unacquainted and not kept up to date with the latest developments in our industry, although we may sometimes lack the time to read and digest all that is published. We are served by a first class technical Press to whom we are much indebted. It can be no light task to sift from the mass of technical information which flows into their offices that which will be of importance and interest to all engaged in the gas industry and to condense it in such a form that the subjects dealt with are sufficiently covered.

Underwater Pipeline in Wales

A Team of Dutch underwater engineering experts have just completed an outstanding project by the laying of two 18 in. gas mains over 700 ft. long on the bed of the River Usk.

The operation which was watched by several hundreds including gas, civil and oil engineers took nearly six hours on each of two days, the pipes being floated into position over a trench which had been dredged in the river bed.

Plans for the scheme, which is part of an ultimate intermediate pressure ring main, were laid only six months ago and the immediate effect will be the improvement of supplies to the east bank of the Usk in Newport, Mon., where industrial development is taking place and where a neighbourhood unit of some 3,500 houses is planned.

The problem was how to supply the gas for the two mill. cu.ft. gasholder, which was constructed two years ago at the Mendalgief Road Undertaking, on the other side of the river. To make the 2½ miles detour over the existing road bridge higher up the river would have meant digging up the roads and dislocating traffic on the already overcrowded London-South Wales road.

A lightweight aluminium pipe over the transporter bridge at Newport docks was suggested but it was eventually decided to carry out the present scheme on the grounds of efficiency and economy. The work was given to Land & Marine Contractors, Ltd., of Liverpool, who called in the Dutch experts.

The Team

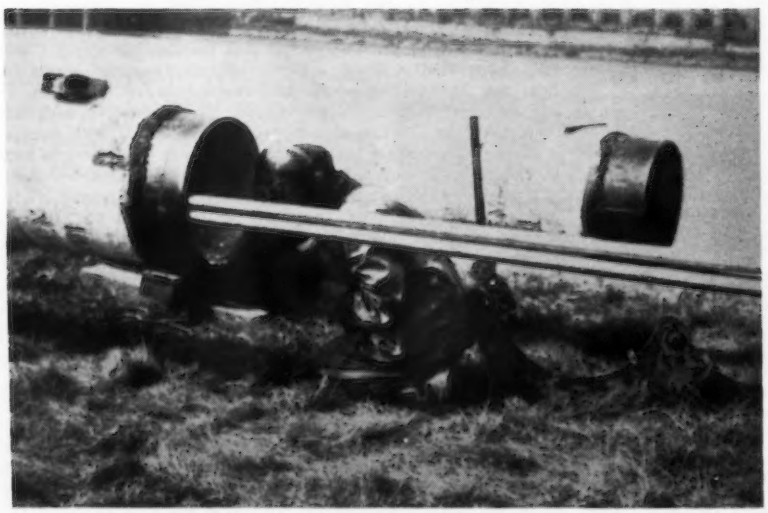
Leader of the team was Mr. F. Neervoort and joint site engineers were Mr. M. Moxley of the Wales Gas Board and Mr. D. T. Evans of the Newport Undertaking. Chief planners at the outset were Mr. A. H. Dyer, deputy general manager and engineer of the Newport Undertaking and Mr. M. F. Scott, assistant distribution engineer to the Board.

Operation Pipeline

Some 30,000 tons of rock and silt were dredged from the river bed in the making of a trench about 8 ft. deep and 20 ft. wide. Thick walled ½ in. steel pipes of 18 in. diameter were delivered from the South Durham Coal & Steel Company in 25 ft. lengths to the river bank where the lengths were welded into two mains each 715 ft. long. The mains were curved to fit into the steep sided river bed and part way along each was installed a 36 in. siphon specially designed because of the total lift of approximately 56 ft.

The welds were tested by the ultra sonic method and the mains wrapped in fibreglass and then thermoglass for protection. Over this was placed a strong wire mesh on to which gunite was sprayed to give the mains negative buoyancy. The insides were treated with two coats of red lead.

A section of the pipeline is being towed into position. For easier manœuvring in the deeper water it is attached to the underside of the boat beneath the water.



A welder in action. The pipes are being fabricated preparatory to launching them into the river.

Twin lines are used so that one may be in operation while the other is being pumped out at a pressure of 30 lb. per sq. in. from a compressor house to be built on the west bank.

High Tides

The placing of the mains, a difficult operation because of the particularly fast running and uneven tides of the River Usk, the rise and fall of which, at 48 ft., is the second highest in the world, was commenced at dawn on Wednesday, September 21.

With the river closed to traffic for the first time in the history of British shipping, one of the mains was lowered on to a flat sandy part of the bank and as the tide covered it seven pontoons were floated into position and attached by winch operated cables.

Lowering the Pipe

Mr. Neervoort directed operations by means of a loud hailer while perched halfway up one of the pylons of the transporter bridge. The incoming tide carried the pontoons up river while cables to the shore guided them into position. At slack water the pipeline,

Length of pipe being brought into position for fabrication.

Sections of the pipeline ready for launching.

after some small trouble with an old timber pile near the shore, was manœuvred into position and eventually lowered into the trench.

A diver and a launch equipped with echo-sounding device stood by throughout the operation which was repeated with the second main the following day. The trench was later partially filled after the mains had been inspected and tested. The natural movement of the river will eventually fill the trench completely.

New Year Supplies

The pipelines will be connected to mains still to be laid on each side of the river and it is expected that supplies will be under way by the new year. Condensate will be ejected through stainless steel tubes bracket welded in duplicate inside the 18 in. pipes. They reach from the bottom of the siphon to a point on the bank. Before immersion the wrappings were tested with a Holiday detector.

At the end of the operation, Mr. Neervoort said: 'It was a very tricky job, but it went according to plan apart from one or two minor setbacks. The main difficulty was the tide.'

STANTON DEVELOPMENT SCHEME

—From p.814

Managing Director of Stanton Ironworks Co., Ltd., who collapsed while accompanying the first party around the works. This sad event cast a shadow over the whole of the subsequent proceedings which, however, continued as arranged.

After the inspection of the new coke ovens and ancillary plant, the party adjourned to the Stanton Ironworks Company's premises at Stanton-by-Dale where luncheon was served in marquees erected inside what is normally a very large lorry garage. Before the luncheon Mr. A. G. Stewart, Chairman of the Stanton Ironworks Co., Ltd., announced to the assembled company the tragic news to which we have referred and at his suggestion, a period of silent homage was observed in honour of the memory of Mr. Watson.

Cost—£5 Mill.

In his toast to H.M. Government later on Mr. Stewart referred to the fact that the major development scheme, a part of which had been seen in the new coking plant, cost altogether approximately £5 mill. of which £2 mill. was spent on the coke oven side and £2¾ to £3 mill. on the blast furnace side. An important aspect of the scheme was the release of large quantities of blast furnace gas for use in heating the coking plant. Now, up to 192 mill. cu.ft. per day of blast furnace gas is cleaned for use in this way and as a result large supplies of coke-oven gas have been made available to the East Midlands Gas Board. The substitution of blast furnace gas for coke oven gas in the oven firing will make available to the gas board up to 24 mill. cu.ft. of the gas per day. Mr. Stewart referred to the fuel economy measures which have been practised by his Company, and he said that since 1947 they had reduced the amount of coal used per ton of finished products from 44.7 to 35 cwt., and this was a substantial contribution. Other aspects of fuel saving were instrumentation, top charging instead of door charging for the furnaces and the use of the hot metal process.

'A Great Contribution'

In his reply the Minister complimented the iron and steel industry on the efficient way in which it used its fuel, and said that no industry had made a greater contribution to fuel efficiency. He also spoke of the importance of the coke and gas produced in steelworks coking plants in the drive for cleaner air. At present the coke ovens provide no less than 70,000 mill. cu.ft. of town gas per year to the gas boards; a further important contribution towards fuel saving at Stanton was the use of large quantities of weakly coking coals mined locally. In his concluding remarks, Mr. Lloyd described the progress in this country's atomic energy projects especially as they affect electricity generation, and he drew attention to the vital part which the iron and steel industry is playing in providing the material from which a large part of these plants is being fabricated.

Atlantic Greetings

In proposing the guests Sir Frederick Scopes, Managing Director of Stanton Ironworks Co., Ltd., said that a number of representatives of the gas industry were unable to be present because they were attending the International Gas Union meeting in the United States. He had received a cable from the party en route for America, in which the Chairman of the Gas Council, the President of the Institution of Gas Engineers and other delegates sent their best wishes. Sir Frederick then referred briefly to the other industries and associations represented and welcomed them in the name of his Company.

The concluding speech was made by Mr. Henry F. H. Jones, Deputy Chairman of the Gas Council, who replied for the guests. In his opening remarks Mr. Jones thanked the Company for its hospitality and paid tribute to the late Mr. Watson, whose technical ability and charming personality were so well known to those present. He then spoke of his experience as Chairman of the East Midland Gas Board in 1949 when he found the Stanton Ironworks Co., Ltd., most reliable in regularly supplying a gas of constant quality.

Up to 'Gasworks Standard'

Mr. Jones said the coking plant at Stanton was quite up to the standard of a gasworks and that this was the best praise a gas engineer could bestow. He thought that the large quantities of gas made available from coke ovens in the East Midlands would be extremely valuable in bringing industry into the area since gas could be obtained there at such a reasonable price. In his concluding remarks Mr. Jones referred to the close co-operation which exists between the gas industry and the Stanton Company in that the latter supplies large numbers of pipes for the industry's mainlaying programmes.

Chemical Engineering—the Way Ahead*

SIR HAROLD HARTLEY, K.C.V.O., F.R.S.

IN the course of his 1955 Presidential Address to the Institution of Chemical Engineers, Sir Harold spoke of the progress made in the past three years. He said that there was today a much more general understanding in Britain of the rôle of the chemical engineer, he was no longer regarded as a misnomer or a curiosity and there was a much wider recognition, too, of the contribution that he could make in industry. Chemical engineering laboratories were being accepted as a necessity in many modern industries. The next few years should see a large increase in the output of chemical engineers from the new departments that would give chemical engineering its place in the engineering schools of most of our universities. New laboratories and larger staffs would rapidly expand the volume of research that was so badly needed. Methods of teaching were being revised to give the young chemical engineer the adaptability and flexibility of mind that needed to face new problems over an ever-widening field of activity, where success is dependent on an analytical approach to an experimental attack with access to the accumulated scientific and engineering knowledge and experience.

Sir Harold paid tribute to the work of members of the Institution both as individuals upholding the traditions of their profession and especially for the devoted and unselfish support that the Officers and Council and the members of Committees had given to the work of the Institution.

Thanks to the generous offer of the Society of Chemical Industry the Institution hoped to move soon into new headquarters in Belgrave Square. Sir Harold named those who had enabled the Institution to furnish and equip the new rooms, *viz.*, The British Petroleum Co., Ltd., Courtaulds, Ltd., The Distillers Co., Ltd., Esso, Imperial Chemical Industries, Ltd., The Shell Petroleum Co., Ltd., and Unilever, Ltd.

The O.E.E.C. Conference

As a result of a report which drew attention to the advantages possessed by America over Europe in the much larger numbers of her chemical engineers, the Institution was invited by the O.E.E.C. to organize, in co-operation with the D.S.I.R., a European Conference on 'The Functions and Training of a Chemical Engineer in Europe.' The Conference, which was held in London at Church House from March 21 to 23, 1955, was attended by 68 delegates from 12 European countries, 110 delegates from the United Kingdom and 165 other members. It included visitors from Australia, South Africa, and the United States. Two sessions were devoted to discussing the functions of a chemical engineer in industry, two sessions to his under-graduate, post-graduate and part-time academic training, one session to his training in industry and one to the scope and need of research in chemical engineering.

It had been most encouraging to the teachers to hear from industrialists from the United Kingdom, France and Italy the valuable contribution that the young chemical engineer trained in the modern university courses is making in industry. Sir Christopher Hinton, Dr. Holroyd and Mr. Kearton spoke for the United Kingdom. From Germany came a different philosophy: Chemists must remain chemists and engineers remain engineers, the planning and design of a plant depending on the co-operation of the chemist with the process engineer. This divergence of opinion from our conception of a chemical engineer came up also in most of the later sessions on education. It was evident, however, that Professor Schoenemann of Darmstadt did not altogether share the views of his colleagues as he spoke of the need to give some chemists a technological training, since chemistry was the decisive factor in selecting the flow sheet and the general design of a plant.

However, the main outcome of the Conference was to reveal the unanimity of opinion among both industrialists and teachers of the other twelve European countries represented there as to their conception of chemical engineering as a fourth primary technology. This emerged quite clearly both in the papers and discussions and in a number of private talks which Sir Harold had with foreign delegates. The value of the papers and discussions on methods of teaching was therefore greatly enhanced since all were striving towards a common objective which could be helped by co-operation. In this way the Conference undoubtedly made a notable contribution to European co-operation in our own field by bringing together so many of the teachers of chemical engineering.

The last session dealt with the scope and need of research in chemical engineering. The papers emphasized the need for more research and particularly the need to codify the existing data available for use in detailing design. They also helped to define the fields of work most suitable for academic laboratories for industry and for organizations like the Research Institute for Process Engineering at the Technische Hochschule at Aachen, which is a co-operative effort of the Government, industry and the Technical High School. The speed with which this new Institute has come into action and its obvious advantages are in sad contrast to the delay in implementing the Cremer Report which years ago recommended the formation of a similar organisation in this country. In Sir Harold's opinion this was the next major project to which the Institution should devote its energies and advocacy.

Chemical Engineering and the Future

At the end of his closing speech at the Conference, Sir Harold spoke very briefly of chemical engineering and the future. The country was face to face with the problems involved in meeting the growing demands for higher standards of living for the ever increasing population of the world. On satisfying these demands would well depend the future of civilization as it is understood in Britain. One fact is abundantly clear, that chemical engineering is intimately involved in supplying all those major needs—whether they are food, fuels and energy, water, metals, materials and drugs such as antibiotics. The techniques of chemical engineering are being applied every day in new fields.

In his Fawley Lecture last year Sir Harold gave a general outline of the world problem with reasons for optimism provided that difficulties were faced and prepared for and that the disaster of a nuclear war was avoided.

Instrumentation and Automatic Control

With full employment one of the limiting factors to increasing the volume of production in this country was manpower, but a greater use of instrumentation and automatic control would offer both the advantages of higher productivity and improved quality, a combination not always found in some of the other ways of increasing output per manhour.

In the chemical and process industries the whole tendency was towards continuous plants with the economies they offered in capital cost, manpower and throughput—whenever the volume of production was sufficiently great. Such continuous plants had demanded a large amount of instrumentation and automatic control and one of the main purposes of a pilot plant was to investigate the instrumentation required. In many cases the plants had been designed and the instruments and control added later and, in fact, all processes were really manually controlled because every major load change in general required re-setting to the desired values of all the controls. Sir Harold believed electronic devices to be much quicker and more accurate than the human senses and with appropriate servo-mechanisms, offered great advantages. With the rapid advances in the design of automatic controls, design engineers had been able to make considerable improvements by the incorporation of the latest standard instruments as they came on the market. Recently this approach to the process design problem, the addition of controls to process flow sheets, had reached something of a stalemate. It was now clear that the

* An abridged account of Sir Harold's presidential address.

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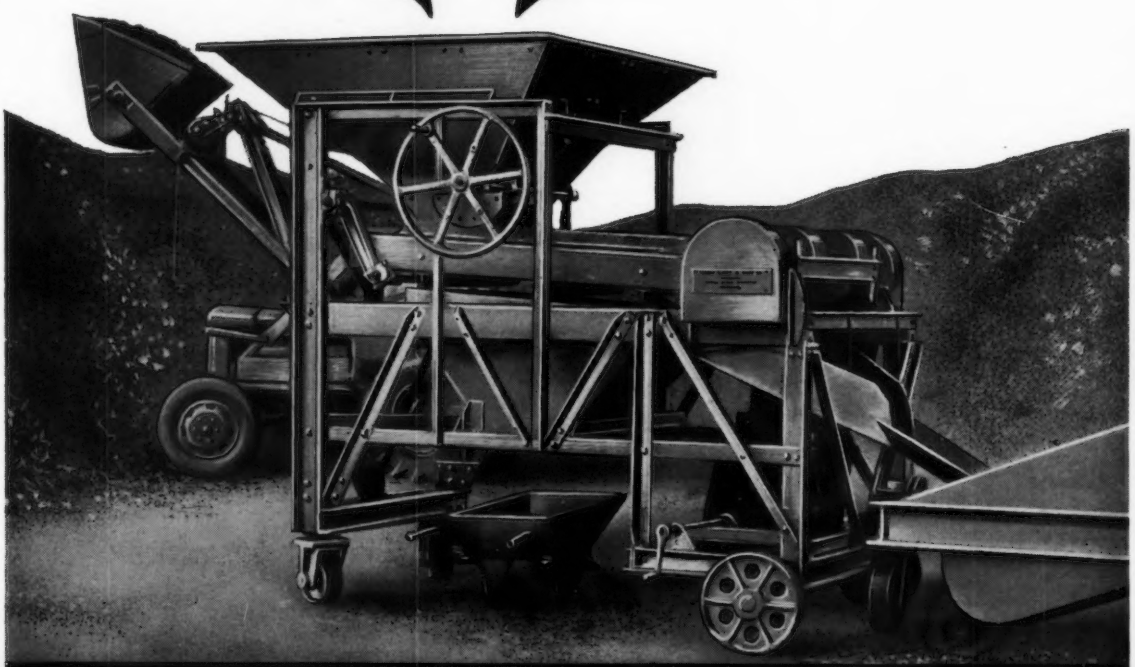

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major advances would only be achieved if the use of automatic control was considered in the earliest design stages. This meant that there would have to be consultation between the chemical engineer and the automatic control engineer from the earliest stages, and a sympathetic understanding between them.

There must be some advance from the stage of adding process controls in an empirical manner. This was not an easy matter, however, and it would call for a basically new approach to the problem of process design. Two difficulties appeared to stand out. First there was a grave shortage of automatic control engineers with the necessary experience. Coupled with this was the shortage of chemical engineers with sufficient understanding of the theoretical approach to automatic control. Second there was an almost complete lack of the information on plant and process characteristics required to enable automatic controls to be applied scientifically. Thus a dual problem of education and training on the one side and lack of quantitative data on the other would have to be faced.

Sir Harold illustrated the latter point by comparing it to the method of design and automatic controls for mechanisms like gyrostats or rolling mills in which the dynamical characteristics of the various elements were known, *e.g.*, their inertia, so that theory could be applied to control design and the results tested in an electronic simulator in which the effect of variations in the mechanism or the control equipment could be seen in an oscilloscope, thus making it possible to design the best types of control for the purpose in question.

This would rarely be possible at present with a process at the flow sheet stage of design, because the essential data concerning the effects of disturbances on the operation of the units of the process were unknown. The research chemist hitherto had only been interested in investigating a steady state, but a twofold approach was necessary. On the one hand the characteristics of a plant, its reactions to disturbances, could be investigated on the laboratory and semi-technical scale and compared with theoretical predictions, thus building up a body of tested knowledge and technique with which to predict the characteristics of a full scale plant. On the other hand, it was essential that every opportunity should be taken of determining the reactions of plants to disturbances in their working conditions to accumulate a body of knowledge of their dynamic characteristics, which could then be correlated with the predictions of their behaviour based on theory checked by laboratory and semi-scale investigations. Only in this way would it be possible gradually to accumulate data and experience of plant characteristics in order to apply theory with confidence to determine the design and method of operation to give the most economical results by means of quality control. The urgent need to collect data concerning the operating characteristics of full-scale plants and particularly to carry out the basic theoretical work was another strong argument for the co-operative research institute of which Sir Harold had already spoken. In this connection it was most encouraging to see that Imperial Chemical Industries was now extending very considerably its central instrument laboratory in order to accelerate the work directed to the improvement of control system design which it commenced immediately after the war. With their wide range of plant they were in such an advantageous position as to contribute to the advancement of knowledge in this field.

The research chemist must learn to think in terms of the dynamic behaviour of processes and their relevance to control theory, and the chemical engineer must learn to co-operate with the control engineer and provide him with the necessary plant characteristics for the design of control equipment. This obviously implied closer working in future between the chemical engineering and the control engineering and electronic departments of universities leading up to post-graduate courses in process control for those who proposed to become specialists in that field.

Education

Sir Harold concluded by talking of the place taken by the universities and colleges of technology. In the undergraduate course they could obviously only be outlined briefly in a review of possible fields of specialization which a chemical engineer might follow. He referred to Sir Christopher Hinton's comparison of the spectrum of chemical and civil engineering, who pointed out the wide spread of civil engineering and the number of specialist activities it embraced, all with a common educational background. He compared with this the way in which the spectrum of chemical engineering was widening and the need to anticipate the many specialized branches which were its future destiny. Clearly the future undergraduate training in engineering would need to be concentrated on those parts of the basic sciences and mathematics which were relevant to its major activities and on the methods of their application to engineering problems, leaving the practical training to vacation courses and the initial years in industry. The other essential content of the academic course was to give the student some opportunity to grasp the essential part that research must play in development and to understand how it must be integrated with management.

There was a new responsibility thrown on the chemical engineering departments to help in building a bridge between their own and the other departments concerned, microbiology, mining engineering and control engineering and electronics. The existence of these bridges would enable postgraduate students who are attracted by the opportunities which these new fields offer to get the necessary training in a second range of techniques. There was clearly a need for postgraduate courses in a number of such borderline subjects in universities or colleges of technology selected for the dual opportunities they can offer.

With the inevitable growth of specialization in the ever-widening field of engineering every major project became a combined operation in which the various techniques would all play a part. In view of this it was encouraging to hear from the industrialists at the O.E.E.C. Conference that one asset of the chemical engineer was his ability to understand the different points of view of his technical colleagues and thus to act as an effective co-ordinator of their contributions to his own field. Sir Harold said that in this connection one of the happiest incidents of his year of office was the occasion when the three senior institutions brought the Institution of Chemical Engineers into consultation with them to discuss the future of higher technological education. More and more the world would need chemical engineers and the Institution had a great contribution to make to the future of Western civilization.

A TEXTBOOK ON FUEL

It is 20 years since the last edition of *Fuel—Solid, Liquid, and Gaseous*, by Professor J. S. S. Brame and Dr. J. G. King, was published. In editing the fifth edition, which was published last week by Edward Arnold, Ltd., price 50s., Dr. King found it necessary to re-write almost the entire book, a considerable undertaking. The reason lies with the many advances made in fuel technology since the previous edition, particularly during the last decade. These advances include, notably, the use of pulverized coal, the conversion of coal to oil, and the full-scale development of catalyst-cracking of petroleum. Dr. King makes it immediately clear, however, that the book has not been written to include the processes of production or utilization of fuels. It is limited strictly to the properties of fuels and their methods of application, and is intended to serve as a broad introduction to fuel technology and to give the necessary guidance for further study. In this respect the readers have been supplied with ample references. Brief mention is made of atomic, solar, and hydro energy, but the book is devoted principally, as might be expected, to coal, oil, and gas. Indeed, Dr. King deals so comprehensively with coal that he tends to repeat himself. He also concerns the readers with underground gasification, complete gasification, and domestic heating. He makes an intriguing suggestion in the preface that the three nationalised fuel industries will probably develop into a united fuel control in which the appropriate fuel will be used for the most suitable purposes. A final chapter of contemporary interest deals with the choice of fuel and its efficient utilization. This matter has become of greater and greater popular interest and concern since the nationalisation of the fuel industries and the consequent heavier costs of fuel. Dr. King treats the subject appropriately, broadly, and well, as indeed he treats the whole of the subject matter of the book.

Eastern Section Revisits Sheringham

Fifth Annual General Meeting

THE fifth annual general meeting of the Eastern Section of the Institution of Gas Engineers, postponed from mid-June because of the national emergency arising out of the railway strike, was held at the Grand Hotel, Sheringham, on September 19 and 20 under the Chairmanship of Mr. W. A. Evetts, M.C., Divisional Engineer, Watford Division, Eastern Gas Board. The weather was ideal for a Norfolk coast holiday, the attendance, despite the postponement, was well up to average, the golf course and bowling greens were in perfect condition, and the hotel arrangements called forth unstinted praise. Several members and their ladies found it possible to make the acquaintance of the golf course over the week-end, so that members were ready to start for the annual competition at 8.45 on the Monday morning. The bowlers began a little over an hour later on the green of the Morley Club. The serious business opened with a meeting in the ballroom lounge of the Grand Hotel on the Monday afternoon, at which, after Mr. Evetts had welcomed Mr. Henry F. H. Jones, Senior Vice-President of the Institution and Deputy Chairman of the Gas Council, and other guests, Mr. B. Wilkinson, Planning Engineer of the Watford Division, presented a paper on 'Some Power Problems Involved in the Manufacture and Distribution of Gas,' with which we shall deal in a later issue of the 'JOURNAL.' Councillor A. E. Hamlin, J.P., Chairman of the Sheringham Urban District Council, gave the meeting a good send-off by offering it a civic welcome.

Councillor Hamlin, accompanied by Mrs. Hamlin, again figured in the Monday evening proceedings, when, together with Mr. and Mrs. Evetts, they received the guests at the official reception. During a break in the dancing, which continued until midnight, Mrs. Evetts graciously presented the golf and bowls trophies as follows:

Golf: Turner Trophy, J. B. Clay; George Wright Cup, H. C. Dunbar; 1st prize, C. E. Byrt; 2nd prize, E. Aspinall; 3rd prize, F. D. Drake; 4th prize, R. F. Robinson.

Bowls: Fred Wilson Cup, E. Stansfield; Derrick Wilson Cup, H. Alcock; 2nd prizes, E. F. Hughes and D. Whiteley; 3rd prizes, J. T. Bradshaw and F. C. Bedloe.

The Chairman's Address

The highlight of the annual general meeting held on the Tuesday morning was the Chairman's Address delivered by Mr. Evetts (published on other pages of this issue).

MR. E. H. WINCH, Divisional Engineer, Cambridge, in proposing a vote of thanks to Mr. Evetts for his address, said he was sure he was speaking for everyone when he said how glad they were that this opportunity had occurred to enable the annual meeting to be held after the disappointment arising from its postponement in the early summer because of circumstances beyond their control. The annual meeting was the culmination of a Chairman's year of office, and the time and thought given to the preparation of a Chairman's Address must always be considerable. Had the meeting not been possible, not only would the Chairman's efforts have gone unrewarded, but the members would have been the poorer for having been denied the opportunity of hearing his address.

The address was characteristic of others Mr. Evetts had given to various professional bodies in that it revealed a skill for marshalling and analyzing facts gleaned from many sources, a skill for interpreting them in a logical way, and for presenting them to his hearers in a palatable and digestible form. He never failed to point the lessons or trends which his facts indicated and to point them in a way that was not only helpful but which fixed them in their minds as something well worth remembering. The thoughts which he had put before them were no idle dream born in a period of reflection, for they knew he was an engineer who practised what he preached, and that the undertakings with which he was concerned were always well in the forefront of progress. Mr. Evetts had worthily upheld the traditions of the Eastern Section and its predecessors.

MR. D. B. PARKINSON, the newly-elected Junior Vice-Chairman, in seconding the vote of thanks, said all who had been associated with Mr. Evetts had learnt to appreciate what a fine engineer and a pleasant charming colleague he was. They had expected an interesting and informative address from him and they had not been disappointed. Mr. Evetts had specialized in the study of costs of gas manufacture and distribution and in forecasting gas demands, and his 'new look' chart dealing with the increased cost of coal pointed to the soundness of altering their ideas in considering making gas from oil instead of from coal. These changed circumstances and the long period that elapsed between ordering and starting up new plant made it difficult to reach right decisions in planning new installations. The Chairman had spoken with special authority about the four new towns in the Watford Division where, but for the ingrained desire to sit in front of a solid fuel fire, any changeover from solid to gaseous fuel would add to their peak load problems.

The vote of thanks was carried with acclamation.

New Members and Officers

Four new members were welcomed by the Chairman: A. F. Dann (District Manager, Maldon, Ipswich Division); G. V. C. Davies (Director, Humphreys & Glasgow, Ltd.); C. T. Hawkes (Humphreys & Glasgow, Ltd.); and D. Whiteley (Newton Chambers & Co., Ltd.).

The election of officers for 1955-56 was confirmed as follows: *Chairman*, J. H. Greenacre (Yarmouth); *Senior Vice-Chairman*, R. C. Wardell (Boston); *Junior Vice-Chairman*, D. B. Parkinson (Area Liaison Officer, Eastern Gas Board); *Hon. Secretary and Treasurer*, J. Hunter-Rioch (Cambridge); *Management Committee*, E. H. Winch (Cambridge and K. C. Rees (Watford).

MR. S. M. MILBOURNE proposed the adoption of the annual report, a record of a successful year's activities, and recalled that when he joined the former Eastern Counties Association in 1928 it was the only district organization that admitted contractors to membership. They were regarded as rogues and vagabonds, but a change had taken place, to the advantage of all concerned. He congratulated the officers and committee on the success of the past year's work.

MR. K. B. MEGGITT (Bedford) seconded and the report was adopted. The accounts were also adopted, on the proposition of MR. HUNTER-RIOCH, seconded by MR. F. C. BEDLOE.

Mr. J. H. Greenacre was appointed District Member of the Council of the Institution, and Messrs. A. W. Mather and H. H. Redwood were re-elected Auditors. On the proposition of MR. R. C. WARDELL, seconded by MR. J. T. BROOKES, it was unanimously agreed to contribute the usual £30 to the Benevolent Fund.

MR. HENRY F. H. JONES, deputizing for Mr. W. K. Hutchison, President of the Institution, conveyed warmest greetings and expressed thanks for the Section's continued support of the Benevolent Fund. Two subjects, he said, were very much in the minds of gas engineers today. The first was the question of how they were going to make gas in the atomic age. Sir Christopher Hinton had issued a warning about expecting too much to be done too quickly in the development of atomic power, and he (Mr. Jones) felt that whatever might happen in the development of electrical generation by atomic energy there would still be a place for the gas industry and the other fuel industries. If the development of civilization proceeded in the future as it had proceeded in recent years the demand for energy would be such as to necessitate using everything as economically as possible. If in the next 10 or 20 years we were to see the clean air policy implemented in the only way that it could be implemented quickly, whatever else might be used, carbonization must go on, and one of their problems was to see how they could keep the carbonization process in step with other processes.

The other outstanding subject very near to their hearts was the future of the Institution and of the professional gas

engineer. Membership of the Institution was increasing; indeed it had never been more healthy and virile in its long history, but what about the recruitment of young engineers? A great deal of thought was given by many people to the qualifications required in a gas engineer, and they hoped that suitable young men of the right calibre would come forward in the future, as they had in the past. One of the strongest points they had in their favour in getting young men with sufficient education and personality and character and intellectual power was that good fellowship had been and still was traditional in the gas industry.

MR. EVETTS, at the close of the session, introduced his successor, Mr. Greenacre who, he said, had been a member of the Section since 1941, and was a Justice of the Peace for Yarmouth. He handed to Mr. Greenacre the brief case containing the records of the Section and of the Association which preceded it.

MR. GREENACRE, in acknowledging his election, said he was conscious of the difficulties he would have in following so excellent a chairman as Mr. Evetts, but he would do his best, and he hoped it would be possible to hold the annual general meeting next year in June at Yarmouth.

Luncheon Speeches

The programme concluded with the official luncheon at the Grand Hotel on the Tuesday, at which Mr. Evetts again presided.

MR. J. H. DYDE, Deputy Chairman of the Eastern Gas Board, proposed the toast of the Urban District of Sheringham. He recalled the warm welcome the members received from the Chairman of the Council on the occasion of the annual general meeting in 1952 and said how glad they were, after the disappointment caused by the railway strike in June, to be able to make amends and revisit Sheringham on the present occasion.

COUNCILLOR HAMLIN, Chairman of the Sheringham U.D.C., in responding, said the presence of the members of the Section had been an uplift to the town. Sheringham, he said, had been schemed and planned and built by private enterprise and its inhabitants were proud of its unspoiled natural attractions. Having been present at the opening session of the meeting, at the civic reception, and again at the official luncheon, he expressed warm appreciation of the work of Mr. W. H. Wosencroft in introducing the guests, in officiating as toastmaster, and in looking after many of the details which contributed to the success of such a gathering. He also thanked the manager and the staff of the Grand Hotel for the way they had looked after the comfort of the visitors.

MR J. H. GREENACRE, Chairman-Elect, proposed the toast of the guests, among whom he mentioned Sir John Stephenson, Chairman of the Eastern Gas Board, and Lady Stephenson; Mr. R. H. Epps, Secretary of the Board, and Mrs. Epps; Mr. H. F. H. Jones; Councillor and Mrs. Hamlin; Mr. F. G. Jordan, who was Chairman of the Council in 1952; Mr. A. Allen, Chairman of the Midland Section, and Mrs. Allen; Mr. Dyde; Mr. H. R. Hazeldine, Chief Accountant of the Board; Mr. R. H. Sershall, U.D.C. Surveyor; Mr. J. H. Ashton, U.D.C. Clerk; Mr. R. F. Robinson, President of the Eastern Junior Gas Association; and representatives of the technical and local Press.

A Feast of Good Things

SIR JOHN STEPHENSON replied for the guests and said they had had a feast of good things, among which he mentioned the excellent paper by Mr. Wilkinson, the statesmanlike address of the Chairman, the excellent weather, a happy party, good food, and good fellowship.

MR. HENRY F. H. JONES proposed the toast of the Eastern Section and expressed the hope that pilgrims from the gas industry then on their way to New York would have a thoroughly successful visit. He referred to the long history of the Eastern Section, which began in 1890 as the Eastern Association of Gas Engineers and Managers, and to its distinguished list of past presidents and chairmen, many of whom he knew from the fact that before nationalisation much of his interest in the industry lay in the eastern counties. The Section covered a most interesting part of England, including densely built-up and largely industrial areas and also very rural districts with long distances between undertakings and problems not unlike those found in parts of Wales and Scotland.

Future of the Industry

The Section had the good fortune to cover the area of more than one gas board which must help, as it did other Sections of the Institution, in provoking free and lively discussions at meetings. The strength of the Institution was derived from its members, as was that of any other institution, and the ties between members and the Institution itself were greatly strengthened by the district sections and the work they did.

Under present circumstances coal was becoming scarcer and dearer. The gas industry was developing alternative methods of making gas, was searching for natural gas, and was studying the possibility of importing it. Many of these lines of search and research were likely to lead to progress sooner or later; in fact oil gasification was already spreading rapidly as a process up and down the country. But as the industry had been organized for many years, and was still organized in many places, members of technical institutions found much of their time taken up with commercial problems, and in the last resort the problem of sales might be the most important. It had always been so with the gas industry.

In coupling with the toast the name of the Chairman, Mr. Jones said he had known Mr. Evetts for very many years, in fact since he was a schoolboy. He remembered him as 'Young Evetts' and later as 'Major W. A. Evetts, M.C., Royal Artillery.' He had always had the highest possible regard for him, both as a man and as a very sound engineer who was a credit to his profession. His wide experience and careful analytical approach to problems were well disclosed by his first class Chairman's Address.

MR. EVETTS, in a brief reply, said he had known Mr. Jones's grandfather and father; all three generations were very distinguished engineers. There was no doubt that when he succeeded to the Presidency of the Institution next year he would fill the office with distinction. The Eastern Section was a very healthy section, thanks to the support which it received from Sir John Stephenson and Mr. Dyde, Chairman and Deputy Chairman of the Eastern Gas Board, as well as from members of the East Midlands Gas Board, and to the excellent work of the Hon. Secretary and those who assisted him. Mr. Hunter-Rioch had been a tower of strength to him throughout his year of office.

Coal Board's Superannuation Scheme

The 8th Annual Report of the National Coal Board Staff Superannuation Scheme shows a further increase in the membership and an expansion of income from investments which have resulted in the gross total income rising to approximately £12.1 mill. in the year ended April 5, 1955, compared with £11.0 mill. in the year before. The net increase in the number of members during the year was 3,984, bringing the total to 87,348. The income was made up of £2.9 mill. members' contributions, £6.7 mill. employers' contributions and £2.5 mill. from investments.

Assets rose to £56.8 mill. and it is expected that the future rate of growth of the Fund will be between £9 and £10 mill. a year for many years to come. 49.6% of the investments are in British and Dominion Governments, Local Authorities and Public Boards, 16.3% in Debenture Stocks, 24.1% in preference and ordinary shares and the remaining 10% in real estate, and liquid funds. The combined effective average anticipated yield on book values of the investments, after allowing for income tax at the standard rate on the Lump Sum Fund, was £4 4s. 8d.% compared with £4 2s.% the year before.

Total expenditure on benefits during the year was approximately £2.0 mill., of which about £705,000 was in retirement pensions, £12,000 in family benefits, £889,000 in lump sums on retirement and withdrawal, £331,000 in death benefits and £63,000 on transfer to other schemes. At the end of the year, 6,080 retirement pensions were being paid, 137 widows' pensions and 123 children's allowances of an aggregate annual value of approximately £700,000.

The First of 120,000 letters of invitation to the 1956 British Industries Fair are now being sent to Australia and New Zealand, the Far East, Africa and South America. The remainder of the letters, which are prepared in nine languages, will be sent over the next two months to buyers in another hundred countries, from Iceland to Indonesia.

MANCHESTER & DISTRICT I.G.E. VISIT THE DERBYSHIRE SILICA COMPANY

The photographs above were taken during the visit on September 9 and show: (Left) Messrs. C. H. Leach, A. Harrison Slade, A. H. Nicholson (Section Secretary), S. F. J. Beale (Managing Director, Derbyshire Silica Firebrick Company) examining a specimen retort. (Right) Mr. Frank West (Chairman, Derbyshire Silica Firebrick Co., Ltd.) speaking at the luncheon at the Palace Hotel, Buxton; left to right, Messrs. J. M. McLusky (Section Vice-Chairman), F. West, W. S. Hubbard (Section Chairman), E. West, R. G. Greaves.

Gas Purification Expansion

Consequent upon the expansion of the activities of Gas Purification & Chemical Co., Ltd., to cover a wider field, it has become necessary to separate the division dealing with activated oxide, bog ore, and spent oxide from the parent company. The name of this new company is Gas Purification, Ltd., of the same address, Palmerston House, 51, Bishopsgate, London, E.C.2. (T/N.: 7930/7938/9.)

It is emphasized that the only change is in the title. There will be no break in the continuity of the business; indeed, the staff will be the same and the good relations which have existed between the gas industry and the Company for a period of over 70 years, will be further enhanced. Mr. W. J. Dore, who has served G.P.C., Ltd., for 27 years as Chemist and Technical Representative, has joined the Board of Gas Purification, Ltd.

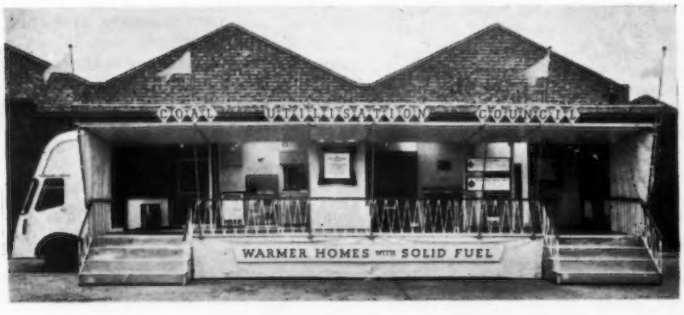
The Directors of Gas Purification, Ltd., are Mr. P. Wheeler, M.INST.F. (Chairman), Mr. J. R. Sorsbie, Mr. P. R. V. Wheeler, and Mr. W. J. Dore, ASSOC.M.INST. GAS E. Mr. J. Bishop is Secretary.

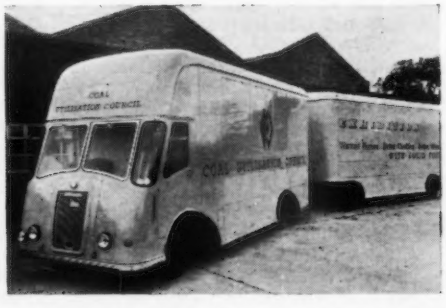
An old single-track railway from Ashby-de-la-Zouch to Lount, part of the old route to Derby, is being taken up, but not the loop line leading to the Ashby gasworks, a distribution centre for coke supplies to a large area.

Northern First Aid Final

The Area First Aid Final Competition was held in Newcastle-upon-Tyne on September 10, when teams from Blyth, Darlington, Hartlepools, Newcastle and Sunderland competed. They had reached the Final by winning eliminating competitions in different parts of the Area. The Blyth team were successful in winning the competition, the runners-up being the By-products Works team, Newcastle-upon-Tyne. At the close of the competition, Mr. J. E. White, Deputy Chairman of the Board, presented the Challenge Shield and individual prizes to the members of the winning team which will now represent the Northern Area in the National Competition in London.

FUEL EFFICIENCY ROAD TOUR





Modern fires and stoves burned merrily away in a giant motor vehicle and trailer in London last week. The Coal Utilization Council was demonstrating its new 51 ft. long mobile exhibition unit before sending it to the towns and villages of South East England. The unit carries a display of modern domestic solid fuel appliances, including new fires, cookers, heating stoves and a boiler. All the appliances are recommended by the Council as being efficient, and they are capable of burning a wide variety of solid fuels, including smokeless fuels. In addition to the appliances there are display cabinets of suitable fuels and, at the rear of the trailer, an information desk. The unit was specially designed by the Council's display team. Apart from showing householders the latest appliances, it will also be available for special demonstrations to local authorities.

GAS CONSULTATIVE COUNCILS

Call for Reduced Interest Rates

The North Eastern Gas Consultative Council at its meeting in Leeds on September 19, rejected a request from the Northern Gas Consultative Council for support for the following resolution which the Northern Council had sent to the Chancellor of the Exchequer:—

'This Council having agreed to the increase in gas prices as proposed by the Northern Gas Board views with concern the increased amounts the Board is called upon to pay not only for coal but for other essential services. Included in the costs contributory to the increased gas charges are additional charges for interest upon loans used for the development of the industry, and it is the opinion of the council that the Chancellor of the Exchequer should find alternative methods of arresting inflation than the raising of the Bank Rate to public utility services and other essential industries. Not only does increased rates of interest have harmful effects upon such industries but fail also to discriminate between luxury trades and the essential industries of the nation.'

Councillor G. W. Clough, Ilkley, Alderman H. Hardy, Morley, Alderman Mrs. J. Smith, Huddersfield, Alderman H. Sutcliffe, Horsforth, Mr. A. L. Mollett, Bradford, and Alderman Whitaker, Todmorden, took part in the debate. Alderman Whitaker, supporting the resolution, made the point that the cost of armaments was the real cause of inflation in this country, and that if armaments were cut down by the Government that would be the most effective alternative method of arresting inflation. Other speakers pointed out that the raising of the Bank Rate was only one of many causes of inflation, and one speaker thought public loans should not be subject to the higher rate of interest because it meant the lower paid workers suffered a higher proportionate expense.

The meeting finally decided against supporting the resolution on the grounds that if the Bank Rate had to be raised there appeared to be no good reason why the gas industry should be exempt.

Zoning of Goole

The council received a deputation from the Goole Corporation which sought to have Goole transferred from Zone 2 to Zone 1 in regard to the price of gas. It was argued that Goole before nationalisation had the lowest priced gas in the West Riding, and this was due to the fact that coal had been for the last 50 years, and was still, brought direct by barge about five miles from the coal face to the gasworks at a cost much less than the usual rail transport charge which was given as one of the reasons for the increased price of gas.

Alderman Whitaker did not think Goole had established any better claim for preferential treatment than many other areas or towns, including his own, which, as he had frequently pointed out, suffered heavily from the zoning system. Alderman Sutcliffe said there would be anomalies under the zoning system, and he considered Goole, like many other districts, was helping the average. The Council finally decided not to grant Goole's application for transfer from Zone 2 to Zone 1.

Purchase Tax

The Council went on to consider a letter received from the North Eastern Area Council of the National Chamber of Trade asking if the North Eastern Gas Consultative Council would support a motion to be moved at the conference of the National Chamber of Trade to be held in the first week of October urging the Government to remove purchase tax from all space heating appliances.

Mr. Mollett said that to ask the Government to remove purchase tax was a very big thing, and he thought the phrase should be 'to remove or reduce' purchase tax. The Chairman (Alderman W. Regan, Halifax), Alderman Hardy and Alderman Sutcliffe spoke in support and the meeting agreed to support the motion.

New Members

At the meeting the chairman welcomed the following new members to the council:—Councillor Mrs. C. E. Ellis of Hull, Councillor H. O. Griffiths, J.P., of Baildon, Alderman S. Kaye, LL.B., of Huddersfield, Councillor A. Manchester of Bradford, Alderman H. Wadsworth Sellers, O.B.E., of Leeds, Alderman F. Walker, J.P., of Batley, and Mr. W. H. Laycock of Mirfield.

The next meeting was fixed for Monday, November 21.

Pottery Industry Wants Cheaper Gas

The pottery industry in the Stoke-on-Trent area wants cheaper gas for industrial purposes, but the West Midlands Gas Board is unable to accede to the request. The decision was announced at a meeting of the West Midlands Gas Consultative Council held in Birmingham on September 19. Alderman W. H. Malcolm presided. A statement presented on behalf of the Board by the chairman, Mr. G. le B. Diamond, promised that the matter should be kept under review and it was pointed out that the gas industry had to meet competition from other fuels and it was naturally anxious to keep the prices charged for industrial gas as low as possible.

The Board, it was stated, is prepared to enter into special agreements with very large consumers and the pottery manufacturers came into the highest category qualifying for concessions. But, unfortunately, many of the additional burdens which had fallen on the gas industry in recent years represented prime cost increases, such as coal, freight charges, wages and manufacturing capital costs which affected the last therm supplied to a large industrial consumer just as much as the first therm supplied to a domestic consumer. Whenever tariffs are varied much serious thought is given to the exact method of recovering increased costs other than the substantial portion met by internal economies. The domestic, commercial and industrial loads are complementary to each other and both commercial policy and statutory provisions demand that balanced development of these loads should take place in the interests of consumers as a whole. No less than 21%, or 67,600,000 therms of the Board's total sales in 1954 to 1955 was subject to price reductions under special agreements and any failure by the Board to recover prime cost increases in full from large consumers would lead to disproportionately high charges on other consumers.

The decision of the Board was approved by the Council. Mr. R. A. Maddock (Stoke-on-Trent) said he did not see what further action could be taken by the Stoke-on-Trent pottery manufacturers. There would be much disappointment, but at least it was satisfactory to know the matter would be kept under review.

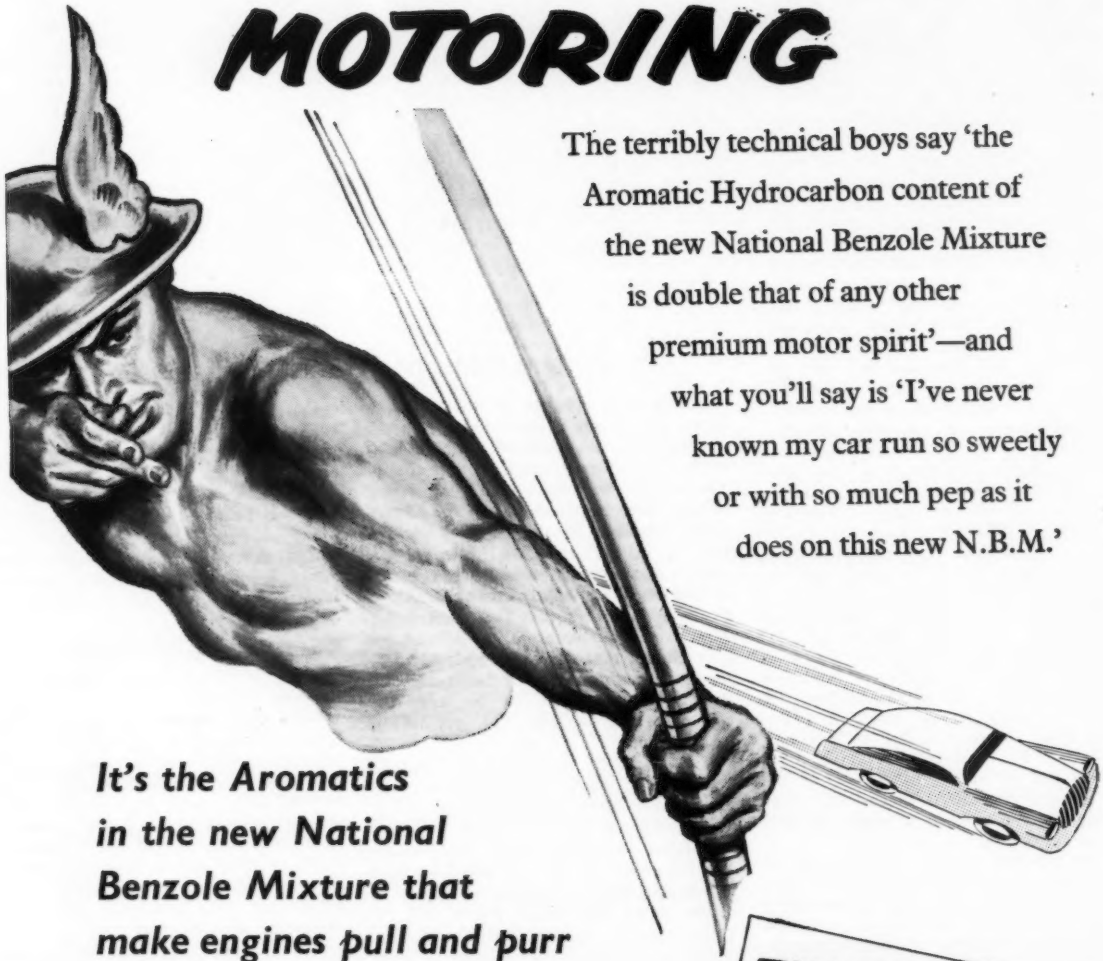
High Price for Lichfield Gas

Lichfield City Council protested at a meeting, on September 14, against increased gas charges and urged uniformity. The Consultative Council has not received official notification, but Mr. Diamond explained that the cost of gas-making at a small station was greater than at a large one and there could be no subsidizing. It had always been the policy of the Board that the price charged for gas should be related to the cost of production in a particular area. Ald. Malcolm pointed out that prior to nationalisation there were 270 tariffs in the area, but now there were only seven.

New Gas Plant at Dumfries

Sir Andrew G. Clow, chairman of the Scottish Gas Board, who presided at a luncheon at Dumfries last week after the opening of a new gas showroom, said that the new plant being installed at Dumfries gasworks at an estimated cost of £250,000, was expected to be in operation in the spring of next year. The new plant would be more economical in the use of coal than the one it was replacing. It would be more efficient, and after making reasonable provision for that heavy expenditure, the gas should cost no more to make at Dumfries than with the old plant. The new showrooms were opened by Provost G. H. Mogerley, Dumfries.

TREAT YOURSELF TO HIGH-AROMATIC MOTORING



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NB41/21

COMPANY MEETING

B.H.D. ENGINEERS LIMITED

Record Sales—Lower Profit Margin

The seventh annual general meeting of B.H.D. Engineers, Ltd., was held on September 21 at the Grosvenor Hotel, Buckingham Palace Road, London, S.W.1, Mr. F. B. Holmes, M.INST.GAS E. (the Chairman) presiding. The following is his report which had been circulated to Shareholders:

'Before referring to the published statement of accounts, it is with regret that your directors have to record the death, at the great age of 94 years, of Alderman George Clark, J.P., an original director of this company. Alderman Clark was associated with the Bryan Donkin Co., Ltd., for over 56 years; he was Managing Director of that Company for 42 years and Chairman from 1938 until his retirement in 1950. He will long be remembered for the great services which he rendered to the Bryan Donkin Company.

The Accounts

'Turning now to the accounts, the group profit for the year before charging taxation amounts to £429,355 compared with £456,011 for the previous year ended March 31, 1954, a decrease of £26,656. Owing to the cessation of excess profits levy and the reduction in the standard rate of income tax, the charge for taxation this year of £235,351 absorbs some £60,000 less than last year. After providing for the interest of outside shareholders in the profits of certain of the subsidiaries, the net profit after charging tax amounts to £191,518 as against £156,844, an increase of around £35,000. The sum of £30,457 has been brought to credit as representing excess taxation provisions in previous years, mostly in respect of the excess profits levy. Your directors have decided to recommend a final dividend of 12½% on the ordinary shares, making a total distribution of 17½% for the year which compares with an equivalent distribution—adjusted for the bonus issue—of 15% in the previous year. This allows the sum of £167,322 to be added to reserves and the profit and loss account balance, compared with £133,185 in 1954, an increase of £34,137.

Consolidated Balance Sheet

'Turning to the consolidated balance sheet, the changes in the issued share capital and capital reserves result from the bonus issue voted at the last annual general meeting. By reason of the profits retained in the business, the total members' interest has increased from £1,205,343 to £1,363,379. This increase has been more than absorbed by the increase in assets. Fixed assets are up by £83,652, stock and work in progress have absorbed a further £80,763 and debtors, *etc.*, a further £101,513. As a result the combined bank overdrafts of the companies which comprise our group have increased by £62,838 to £362,332. It is still, therefore, as necessary as ever to retain the bulk of the profits in the business as additional working capital.

Problem of Rising Costs

'The total sales figure was the highest to date, but due to keener and greater competition, the profit margin is smaller. We, like so many others, view with concern the separate and combined effects of higher wage awards and the increases in the price of nationalised coal, gas and electricity, all of which make for a rise in production costs at a time when it is not always desirable, or indeed possible, to recover the increases by immediate adjustment of selling prices, especially in export markets which are already difficult on basic prices alone. The continued inability of the steel industry to meet the demand upon it for quick and adequate supply of raw materials causes many delays and often unnecessary friction between the contractor and his customer; this results in further damage to the efforts being made to obtain export business in the interests of the country as a whole.

Value of Oversea Visits

'The group's policy to encourage and foster the introduction of new, and the improvement of existing products by its various companies is showing beneficial results. To this end, directors and members of the technical staffs have visited America, Canada, Pakistan and Spain, and most of the countries in Western Europe, during the past year. These contacts are proving extremely valuable.

'The Holset Engineering Co., Ltd., continues to develop. When production of the turbo-charger (under licence from Dr. Alfred J. Buchi of Switzerland) starts further expansion is confidently expected.

'Your directors are very satisfied with the progress which Holdan Engineers (London), Ltd., has made since its formation some eighteen months ago. This company, should, in due course, become an important member of the group.

'The value of orders in hand, at this date, is almost identical with that of last year and therefore, whilst I repeat, any further rises in wages and in costs of material must have a bearing on the final results, your directors are satisfied that, as far as they can at present see, the current year's trading should produce figures comparable with those of past years.

'You will doubtless wonder why my speech was not circulated with the Annual Report as has always been the custom. It was not, as suggested by one of the evening papers, intended as an astute move to bring shareholders to this meeting. The speech was actually completed and ready to go to press when we were approached on the subject of a manufacturing project which appeared to be of great interest to the group, so much so that I decided it would not be right to circulate my speech without some reference to it. Unfortunately it has not been possible, in the limited time available, to complete our detailed investigation, but negotiations are being continued and in the event of our being able to arrive at a satisfactory conclusion, a communication will be sent to shareholders, giving them details of the project and any proposals which the Board have to make.

'In conclusion, I should like to thank, on your behalf, the management, staff and workpeople of our various companies for the contribution which they have made to the year's results. We greatly value the good relationship which subsists and the team spirit shown by all concerned which is of inestimable value and assistance in dealing with the problems and difficulties which are such a feature of industry to-day.'

The report and accounts were adopted and the dividends recommendation was approved.

The retiring directors, Mr. C. Cooper, M.SC., M.I.CHEM.E., M.INST.GAS E., and Mr. G. F. Chambers, M.A., having been re-elected, the proceedings terminated.

Gas-from-Oil in Ireland

Northern Ireland's gas undertakings, worried about the high price of coal and the availability of adequate supplies, are following with interest the joint Ministry of Commerce-Coleraine Borough Council experiment in using existing plant for the production of gas from oil.

For the experiment the Council's existing water gas plant will be converted, and the Council's staff will co-operate with the Department of Industrial and Forensic Science of the Ministry of Commerce, to whom all resulting information will be available for the benefit of other gas undertakings in Northern Ireland. The co-operation of the makers of water gas plant has also been offered on very advantageous terms. The Ministry of Commerce has intimated that it is prepared in the first place to make a grant not exceeding £2,000 for the experiment on the understanding that this sum will be recouped to the Ministry should the experiment prove successful, as they believe it will. It has been stated that so long as Ulster gas undertakings were tied to coal it would be impossible to prevent further increases in the cost of gas. Mr. W. R. Armstrong, Manager of the Coleraine Gas Department, and Mr. A. J. Howard, Director of the Ministry's Industrial and Forensic Science Department, are in charge of the experiments, and it is hoped that the first gas-from-oil will be available at the beginning of next year.

Dublin Gas Company workers have cancelled their strike notice, and have accepted a revised wage offer by the Company. There are 1,200 men involved, members of the Workers' Union of Ireland and the Marine Port and General Workers' Union. The Company agreed to make its offer retrospective to July 14, and this has been accepted by the men.

TRADE NEWS

Hydraulic shovels for gasworks

A recently introduced machine which will be of great interest to those engaged in the efficient running of gasworks, is the Loadmaster hydraulic shovel, manufactured by Chaseside Engineering Co., Ltd. Although designed as a versatile, general purpose tool, it might well have been produced specially for use in gas-making plants. It provides a satisfactory answer, for example, to the common need to load coke for a period, followed immediately by the need to load oxide or some other material. Because of the relative difference in the weights of these materials, no one machine can really efficiently load both materials using the same size scoop. On the Loadmaster, however, this is overcome by a very simple system which is said to permit easy removal and re-fitting of scoops, together with the fact that a wide range of eleven different scoop sizes is available, from $\frac{1}{8}$ to 2 cu. yd.

The machine shown in the accompanying illustration had, only a short while earlier, been loading coke into wagons—now it is shown loading fresh oxide to the purifiers. In this operation it is, of course, important that the oxide should not be dropped in a mass so that it becomes compacted. The manufacturers say that by virtue of its sensitive tipping control the Loadmaster is not only able to discharge its load a little at a time so that the oxide does not become unduly compacted, but can also spread the material and place it accurately so that it requires a minimum of subsequent handling.

Carrying the advantage of easy scoop interchangeability a stage further, the manufacturers have produced a crane attachment which can be fitted in place of any Loadmaster scoop in a very short time by one man. This attachment is capable of lifting one ton to a height of 13 ft. and has a reach of 5 ft. An alternative version, which is available with a longer jib, has a capacity of 10 cwt. and will lift to over 15 ft. This type has a reach of 8 ft. Either of these crane hooks can be extremely sensitively controlled by two small levers in the driver's cab, located close to the steering wheel. They are claimed to be ideal for laying pipes, moving heavy valves and for maintenance work generally where heavy weights have to be moved. Service accessibility has been carefully kept in mind in the manufacture of this machine and, as can be seen, the comfort of the operator has been recognized as being an important part in the general efficiency of running a hydraulic shovel.

The Loadmasters are diesel powered, alternative types of engine being available (Fordson Major or Perkins L.4) and the hydraulic system is activated by the Vickers vane-type pump connected by a double flexible coupling to the crankshaft.—*Chaseside Engineering Co., Ltd., Station Works, Hertford.*

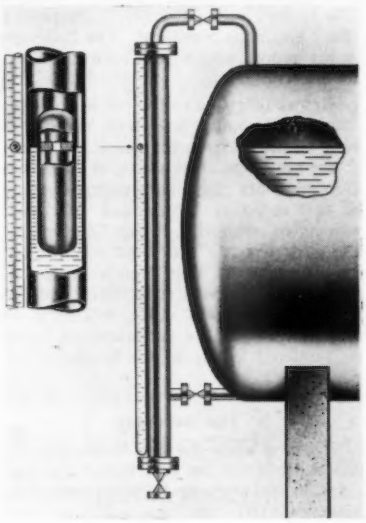
The Loadmaster hydraulic shovel in action.

Liquid level indicator

The simple design of the Ekstrom liquid-level indicator is claimed to obviate the hazards usually associated with gauge glass level indicators by the use of a magnetic coupling between the float and the pointer. The liquid being measured is confined to metal housings and breakage of the gauge glass causes no danger. The indicating pointer is clearly visible at a distance and remains so because the liquid filling the gauge glass is protected from contamination.

As shown in the accompanying diagram the instrument consists of a tube with a float inside it, and a separate gauge glass with indicator. The tube is connected to top and bottom of the tank in a manner most convenient for installation. The tube and float must be of non-magnetic material such as copper, aluminium, K monel or certain grades of stainless steel, since the float has a strong permanent magnet fixed inside it. The dimensions of the float are chosen so that the field of force of the magnet coincides with the level of the liquid. The indicator is a hollow iron sphere 1 in. in diameter, having a density the same as the butanol with which the gauge glass is filled, so that gravitational force is eliminated.

The instrument is claimed to be the obvious choice for handling corrosive, toxic or inflammable liquids and for liquefied gases, because of its complete safety. The operating temperature determines the selection of the gauge glass liquid but butanol has been found satisfactory for most installations.—*Rotameter Manufacturing Co., Ltd., Purley Way, Croydon.*



Schematic arrangement of the Ekstrom liquid level indicator.

Wobbe Index controller

The Sigma-Kent Wobbe Index controller, recently released, affords control of supplies of town's gas in factories to a desired Wobbe number by either automatically adding a small amount of air to the incoming gas or trimming the output of a mechanical mixing machine by an additional supply of gas. The Wobbe Index is a function of calorific value and specific gravity, and the new controller, a combination of the Sigma Wobbe Index recorder and the Kent Mark 20 air-operated controller, enables corrections to be made for changes in both C.V. and S.G.

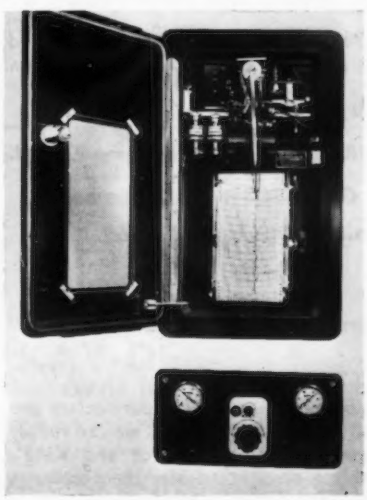
The Wobbe controller is claimed to be the answer to problems which have arisen, for example in the electric-lamp and radio-valve industries, because of small changes in gas characteristics, especially specific gravity. Highly critical industrial processes, such as those connected with automatic glass-working machinery, can now be controlled more accurately and with higher rates of working, because the Wobbe controller enables a perfectly constant heat transfer to be obtained at the gas burners and makes frequent adjustment of flame length unnecessary.

The Wobbe recorder is designed especi-

ally for control purposes and has a very high rate of response. It consists of three main components: flow regulator, heat exchanger, and flow recorder. The function of the flow regulator is to supply gas to a burner in the heat exchanger at a constant pressure. The heat exchanger consists of two concentric vertical steel tubes through which the products of combustion pass to atmosphere. The lower ends of both tubes are rigidly joined together, the upper end of the outer tube being fixed to the instrument case. A bar attached to the upper end of the inner tube transmits the relative expansion or contraction of the inner tube to the recording linkage.

This relative movement is directly consequent on changes in the Wobbe Index of the gas being burned. Ambient-temperature changes have no effect on the apparatus because, in this instance, both tubes respond equally and no motion occurs at the upper end of the inner tube. The relative movement of the inner tube is magnified many times by the recording linkage giving adequate motion to the pen on the chart.

The Kent Mark 20 pneumatic controller is mounted within the instrument case and is arranged to detect the smallest deviation of the recording pen from the desired-value setting pointer through a differential linkage system. The pointer can be set instantly at any Wobbe value desired. The controller mechanism translates the deviation into a change in

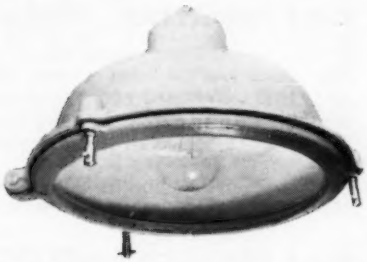


Sigma-Kent Wobbe Index controller.

air pressure in the automatic-control system, which embodies proportional, integral and first-derivative functions of the deviation. This pressure is used to re-position a regulating valve controlling the addition of air or of gas in the mixing system, thus restoring the Wobbe Index of the gas supply to the desired value in the shortest possible time. Experiments with an exothermic furnace-atmosphere generator have shown that great precision of furnace-atmosphere composition can be obtained by controlling the gas mixture to the combustion chamber at a fixed Wobbe Index value.—*George Kent, Ltd., Luton, Bedfordshire.*

Heavy duty lighting

The Winston heavy duty cast aluminium industrial lighting unit, produced by Falk, Stadelmann & Co., Ltd., is claimed to have been designed for heavy industrial use particularly where humid and corrosive atmospheres are



The Winston heavy duty lighting unit.

found, and to be suitable for application in a number of types of industrial installations, especially in chemical and gas-works. It is suitable for indoor and outdoor use.

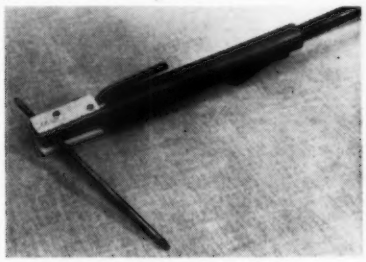
The fitting is intended for use with 150 watt and 200 watt tungsten filament lamps. The body and bezel are of die-cast aluminium alloy *Alocrom* treated and finished corrosion-resistant grey stove enamel. The interior reflecting surface is red-oxide primed with two coats of white heat-resisting enamel (triple stoved). There is a rectangular section compound rubber gasket between the bezel and the body. The domed clear glass is retained in the bezel by safety screws and plastic cement. The clamping screws are lengthened so that the lighting units may be stood on the ground without fear of damage to the domed glass.

The company has also produced a new vapour-proof fluorescent, single or double unit fitting, for use in steamy or corrosive atmospheres.—*Falk, Stadelmann & Co., Ltd., 91, Farringdon Road, London, E.C.1.*

Cutting process

The Arcair torch, which is manufactured by the Lincoln Electric Co., Ltd., is claimed to be of use in cutting, grooving, gouging, or developing mild steel, stainless steel, alloys, brass, bronze, monel, or cast iron. The torch melts the metal by means of an electric arc and then blows away the melted metal through a continuous high velocity compressed air jet. The arc is maintained between the work and a carbon-graphite electrode which is held in the torch thus directing the air and controlling its flow.

The torch is a complete unit, being equipped with a concentric cable, and features an air control valve, self aligning



Arcair cutting and gouging torch.

rotating jet, permitting adjustment of the electrode to any angle, and air cooling for the comfort of the operator. The current is supplied through a D.C. welding machine, and ordinary compressed air at 80 to 100 lb. pressure is used.

The Arcair method of metal removal is now being applied with notable success in foundry operations to gouge defects and to remove unwanted metal. It is claimed to be many times faster than chipping and much cheaper to operate than oxygen gouging. The tool is said to operate readily in restricted space and in any position, and requires no difficult adjustments for use on different materials.—*Lincoln Electric Co., Ltd., Welwyn Garden City, Herts.*

TRADE PUBLICATIONS

Anti-vibration nut

A pamphlet by Guest, Keen & Nettlefolds (Midland), Ltd., describes the various types, uses, and advantages of the G.K.N. Lester anti-vibration nut.

Evaporation

The Evaporative Process for the Production of Sulphate of Ammonia is the title of a comprehensive and well-illustrated publication by Simon-Carves, Ltd., of Stockport.

Catalytic gas

The *Segas Catalytic Oil-Gas Process* is described and illustrated, with some good drawings and photographs, in a booklet published by The Power-Gas Corporation, Ltd., Stockton-on-Tees.

Arc rectification

A 28-page booklet published by the Hackbridge & Hewittic Electric Co., Ltd., of Walton-on-Thames, describes the history, operation, range, components, control, service, and economy of *Hewittic Rectifiers.*

Infinite variation

A series of leaflets and booklets issued by Stone-Wallwork, Ltd., 32, Victoria Street, S.W.1, gives details and applications of P.I.V. (positively infinitely variable) gears.

Pressure transmission

A recently published booklet by Elliott Bros., Ltd., Century Works, London, S.E.13, gives full details of *Drimac,* the differential pressure transmitter which can be used to record or control pressure, flow, and liquid level.

Network analysis

An article, published as a leaflet entitled *Fluid Network Analyser,* by Nash & Thompson, Ltd., of Oakroft Road, Chessington, Surrey, describes the theory and practical data of the instrument in full.

WALTER KING SERVICES

PERIODICALS . . .

GAS JOURNAL. *(Weekly.* Wednesday, By Post, **1s. 5d.)**

The "Gas Journal" has existed as an integral part of the Gas Industry since 1849. Unbiased policy, technical knowledge, accuracy and reliability combine with an extensive news service and modern make-up to make the Journal the leading Gas Industry newspaper.

Annual Subscription (including a copy of the "Gas Journal" Calendar and Directory): Home and Empire, **52s.** ; Foreign, **60s.**

GAS SERVICE AND DOMESTIC COKE.

(Monthly. By Post, **1s. 2d.)**

"Gas Service and Domestic Coke" is the specialist magazine for the Sales and Service personnel of the Industry. It covers all aspects of gas service from the holder to the burner and contains a special large section each month devoted to the utilization of coke. In addition to sound editorials, news items and specially contributed articles, "Gas Service and Domestic Coke" also reports in the fullest possible manner the activities of the numerous Salesmen's Circles, and Solid Fuel Bodies.

Annual Subscription: Home and Empire, **12s.** ; Foreign, **15s.**

BOOKS and ANNUALS . . .

Some current works covering the manufacture, distribution, and sale of gas are :—

KING'S MANUAL OF GAS MANUFACTURE. Now being issued in 10 self-contained sections. Sections available and prices on application.

MANUAL OF GAS FITTING. By R. N. Le Fevre. **30s.**

GAS DISTRIBUTION ENGINEERING. By R. N. Le Fevre **22s. 6d.**

DOMESTIC UTILIZATION OF GAS. By Smith & Le Fevre **20s.**

High Pressure Gas Main Construction (Restall), **10s. 6d.**

ANNUALS:—

"Gas Journal" Calendar and Directory, 25s. ; "Gas Service" Pocket Book 5s.

BINDING . . .

In addition to permanently binding subscribers' journals, (particulars and prices for which we shall be pleased to give on application) we can supply TEMPORARY BINDERS for the Gas Journal, Gas Service and King's Manual of Gas Manufacture, thus enabling readers to *bind their copies as received.* The danger of mislaid or damaged copies is eliminated.

Gas Journal temporary binder } . . . . **13s. 3d.** each inc. postage.
Gas Service " }
King's Manual " . . . . . **9s. 9d.** each inc. postage.

PHOTOGRAPHY . . .

Walter King Photographs specialize in Gas Industry photography of every description—work in progress series, plant, appliances, showroom displays, exhibition stands, social and educational visits of all kinds. Tours for various areas of the country can be arranged. First class photography at competitive rates. Full particulars on application.

WALTER KING LTD., 11 BOLT COURT, FLEET STREET, LONDON, E.C.4

FLEet Street 2236-7.

PUBLISHERS' NOTICE

The " Gas Journal " is published every Wednesday, price **1/3d.**; by post **1/5d.**

Subscription Rates: Home and Empire:—**52/-** per annum; Foreign:—**60/-** per annum. (Both payable in advance.) A copy of the " Gas Journal " Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at **2/-** per line (approx. **7** words)—minimum charge **10/-**. A Box Number address occupies **2** lines, and a further **6d.** is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received **14** days prior to publication if proofs are required. Type area of inside pages **10** in. deep × **7** in. wide; block screen **120**.

BUSINESS MANAGER: S. T. CULLEN

MIDLANDS MANAGER: G. B. Torrance, 42, Wychall Lane, King's Norton, Birmingham, 30. *Telephone:* King's Norton 3868.

NORTHERN MANAGER: Philip W. B. King, Flat 1, 7 Langcliffe Avenue, Harrogate. *Telephone:* Harrogate 67625.

SOUTHERN REPRESENTATIVE: A. Engelhardt, 11, Bolt Court, Fleet Street, E.C.4. *Telephone:* Fleet Street 2236-7.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone: FLEet Street 2236-7. *Telegrams:* Gasking, Fleet, London.

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SPECIALLY ACTIVATED OXIDE OF IRON

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Highest prices paid for Spent Oxide

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Telegrams: "Purification, Stock, London." Telephone: London Wall 7938/9 & 7930

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THE COOKER CLEANER

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RUBBER MOPS

"KAY-DEE" *
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for resale to the public and in bulk for works use.

BALE & CHURCH, LTD.
7, CROMPTON WAY, CRAWLEY, SUSSEX

BUFFALO EJECTOR

For pumping water or other liquids.
Send for List:—
GREEN & BOULDING, LTD.
162a Dalston Lane, London, E.8

PLANT FOR SALE

FOR SALE: NEW GAS-FIRED BOILER by Hartley & Sugden. 160 lbs./hour at 80 lbs. p.s.i., complete with chimney, spare burner and controls. Original purchase price was £419. Our price £200. W. H. COLLINGBOURNE & CO., LTD., 1481, Stratford Road, Birmingham, 28. Phone: Shirley 3303.

APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

WANTED:—Gasworks Stoker or Trainee Stoker. Good Wages. A house will be available at reasonable rental. Applications to the Manager, Wales Gas Board, 19, Broad Street, Newtown, Montg.

Amended Advertisement.

WALES GAS BOARD

SOUTH WALES GAS GRID
GRID MANAGER

APPLICATIONS are invited for the appointment of GRID MANAGER for the South Wales Gas Grid.

This Grid has been planned to collect gas from coke oven plants and the Board's manufacturing stations. Gas is at present being supplied through the grid to receiving undertakings, and further extensions are in progress and are contemplated.

The duties of the successful candidate will include the responsibility for:—

(1) The co-ordination of supplies from the various coke oven plants and from the Board's manufacturing stations into the grid.

(2) The allocation of the gas from the grid to meet the demands of the receiving undertakings.

(3) The maintenance of the grid mains, governors, meters and control equipment.

(4) The operation of future extensions of the grid.

Applicants should have considerable knowledge of the economics of gas production and of distribution and, experience of the design, laying and maintenance of large scale high pressure distribution systems.

The commencing salary offered will be commensurate with the qualifications and experience of the successful applicant, and will be between £1,650 and £1,800, and the post is pensionable.

The successful applicant will be required to pass a medical examination.

Applications stating age and giving full particulars of education, training, qualifications and experience, together with the names of two referees, should be received by the undersigned not later than October 8, 1955.

C. B. MAWER,
Secretary.

2, Windsor Place,
Cardiff.

SCOTTISH GAS BOARD

WESTERN GROUP
SALES AND SERVICE SUPERINTENDENT

APPLICATIONS are invited for the position of SALES and SERVICE SUPERINTENDENT for the above Group.

Applicants should be capable of promoting and co-ordinating sales efforts, have experience in sales and administration, and in the organising and development of displays and advertising.

Previous experience in the Gas Industry while not essential would be an advantage.

The salary will be within the scale £875-£1,075. As the post is superannuable the successful candidate may be required to pass a medical examination.

Applications stating age and giving particulars of education, training, qualifications and experience, together with the names of two referees, should be submitted to the undersigned not later than Saturday, October 8, 1955.

ALEX. JAMIESON,
Group Manager.

'Kessington,'
29, Union Street,
Greenock.

SCOTTISH GAS BOARD

NORTHERN DIVISION
SALES AND SERVICE SUPERINTENDENT

APPLICATIONS are invited from gentlemen with sales and administrative experience for the appointment of SALES and SERVICE SUPERINTENDENT for the above Division.

Applicants should be capable of promoting and co-ordinating sales effort and experienced in the organising and development of displays and advertising.

Previous experience in the Gas Industry while not essential would be an advantage

The salary will be within the scale £875-£1,075. As the post is superannuable the successful candidate may be required to pass a medical examination.

Applications stating age and giving particulars of education, training, qualifications and experience, together with the names of two referees, should be submitted to the undersigned within fifteen days of the appearance of this advertisement.

H. S. MILNE,
Divisional Controller.

50, Cotton Street,
Aberdeen.
September 15, 1955.

WALSALL EDUCATION COMMITTEE

WALSALL TECHNICAL COLLEGE
PRINCIPAL: H. CHEETHAM, B.SC. (HONS.) A.M.I.MECH.E., M.I.PROD.E.

APPLICATIONS are invited for a Grade "B" Assistant in Gas Fitting, to commence duties on January 1, 1956. Applicants, who should possess as a minimum qualification a Final City and Guilds Certificate in the subject, and have had wide practical experience, will be responsible for the teaching of Gas Fitting and ancillary subjects, up to the standard of the Final City and Guilds Certificate.

Salary in accordance with the Burnham Technical Scale for Grade "B" Assistants £525 by £25 to £820 per annum. Increments will be allowed for suitable industrial experience.

Application forms and further particulars may be obtained from the Principal, Walsall Technical College, School Street, Wisemore, Walsall, Staffs., to whom completed application forms should be returned not later than October 10, 1955.

V. MILLSON,
Director of Education.

(*Classified advertisements continued on page* 838)

WALTER KING PHOTOGRAPHS

11, BOLT COURT, FLEET STREET, LONDON, E.C.4
FLEet Street 2236

Specialise in the Photography of Gas Industry Subjects.

QUALITY PRINTS AND TRANSPARENCIES
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★ FINISHED PLANT
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★ INTERIORS, EXTERIORS
★ 3D

APPOINTMENTS VACANT (*ctd.*)

EAST MIDLANDS GAS BOARD

LINCOLNSHIRE DIVISION
GROUP ACCOUNTANT—BOSTON GROUP

APPLICATIONS for the above-mentioned appointment at Boston are invited from persons who possess a recognised accountancy qualification and have the requisite experience.

The duties will involve responsibility for the supervision of the Accounting work in the Group and the preparation of final accounts.

The salary will be within Grade APT. 9 (£700/£800) of the National Salary Scales for Gas Staffs at a figure commensurate with qualifications and experience.

The position is pensionable, and the successful applicant will be required to pass a medical examination.

Applications, stating age, and giving details of education, qualifications and experience, together with the names of two referees, should be addressed to the undersigned to arrive not later than October 8, 1955.

BERNARD CLARKE,
Divisional General Manager.

East Midlands Gas Board,
Belle Vue House,
Carline Road,
Lincoln.
September 21, 1955.

EAST MIDLANDS GAS BOARD

LINCOLNSHIRE DIVISION
TECHNICAL ASSISTANT (DISTRIBUTION)—GRIMSBY GROUP

APPLICATIONS are invited for the above appointment which will be made within Grade APT. 5 of the National Salary Scales for Gas Staffs (£530/£610).

Applicants should hold the Ordinary Grade Certificate in Gas Engineering (Supply) and have a thorough knowledge of modern methods of distribution, including high and low pressure systems, and should be capable of carrying out the detail work in connection with the planning and estimating of new work.

The position is pensionable, and the successful applicant will be required to pass a medical examination.

Applications, stating age, and giving details of education, training and experience, together with the names of two referees, should be addressed to the Group Manager, East Midlands Gas Board, Sheepfold Street, Grimsby, to arrive not later than October 8, 1955.

BERNARD CLARKE,
Divisional General Manager.
September 21, 1955.

EAST MIDLANDS GAS BOARD

LEICESTER AND NORTHANTS DIVISION
VACANCY FOR FIRST CLASS GASFITTER—WELLINGBOROUGH GROUP

THERE is a vacancy for a FIRST CLASS GASFITTER in the Wellingborough Group. J.I.C. conditions and rates of pay (Provincial A rating).

The successful applicant may be required to work anywhere within the Group and accommodation is available under a standard Service Occupation Agreement. The accommodation consists of a flat situated on the Holder Station at Raunds.

Applications are invited and these, stating age, experience and qualifications and giving the name of a referee, should be sent to the Group Manager, Commercial Place, Wellingborough, to be received not later than Wednesday, October 12, 1955.

H. B. TAYLOR,
Divisional General Manager.

Millstone Lane,
Leicester.
September 22, 1955.

EAST MIDLANDS GAS BOARD

SHEFFIELD & ROTHERHAM DIVISION
TECHNICAL ASSISTANT
GRIMESTHORPE WORKS, SHEFFIELD

APPLICATIONS are invited from suitably qualified persons for the vacant position of TECHNICAL ASSISTANT at Grimesthorpe Gasworks.

Applicants should preferably have had experience of Horizontal Retort Installations and Carburetted Water Gas Plants.

The salary for the position will be within Grade A.P.T. 6 of the National Salary Scales for Gas Staffs, ranging from £565 to £645 per annum, and the initial placing on the Scale will be in accordance with qualifications, experience and ability.

The position is pensionable and the successful applicant will be required to pass a medical examination.

Applications, giving details of age, education, training, qualifications and experience, together with the names of two referees, should be addressed to reach the undersigned not later than Monday, October 17, 1955.

C. C. WOOD,
Divisional General Manager.

Commercial Street,
Sheffield, 1.

EAST MIDLANDS GAS BOARD

SHEFFIELD & ROTHERHAM DIVISION
ASSISTANT WORKS CHEMIST
NEEPSEND GASWORKS, SHEFFIELD

APPLICATIONS are invited for the position of ASSISTANT WORKS CHEMIST at the Neepsend Gasworks, Sheffield.

Salary will be within Grades A.P.T. 6/7 of the National Salary Scales for Gas Staffs (£565/£700) per annum and the initial placing on the scales will be in accordance with qualifications, experience and ability.

Candidates should preferably possess some academic qualification and have had experience in the carrying out of routine testing, including analyses on coal, gas and oil.

The position is pensionable and the successful candidate may be required to pass a medical examination.

Applications, giving details of age, education, training, qualifications and experience, together with the names of two referees, should be addressed to reach the undersigned not later than Monday, October 17, 1955.

C. C. WOOD,
Divisional General Manager.

Commercial Street,
Sheffield, 1.

SOUTHERN GAS BOARD

NORTHERN DIVISION: OXFORD UNDERTAKING
WORKS ENGINEER

APPLICATIONS are invited for the position of WORKS ENGINEER at the Oxford Gas Works at a salary within Grade A.P.T. 12 (Provincial A) of the National Salary Scales.

Applicants should be Corporate Members of the Institution of Gas Engineers or hold an equivalent qualification, and be experienced in the technical and administrative control of a medium-sized works employing horizontal retorts and carburetted water gas plant.

The successful candidate will be required to pass a medical examination and, unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required, if eligible, to join the Board's Staff Pension Scheme.

Applications stating age, education, qualifications, training, experience, present appointment and salary, together with a one-page summary of these particulars, should be sent to the undersigned, in an envelope marked "Works Engineer," to reach him not later than October 12, 1955.

S. C. BENTLEY,
Engineer and General Manager.

Oxford and District Gas Undertaking.
P.O. Box No. 3,
Therm House,
St. Aldate's,
Oxford.

NORTHERN GAS BOARD

DARLINGTON DIVISION
ASSISTANT MANAGER—NORTHERN SUB-DIVISION

APPLICATIONS are invited from suitably qualified persons for the position of ASSISTANT MANAGER to the Northern Sub-Division, which includes Bishop Auckland, Spennymoor, Sunderland Bridge, Crook and Stanhope Units.

Applicants should be Corporate Members of the Institution of Gas Engineers and have had a sound experience in modern Gasworks practice.

The salary will be within Grade APT. 10 Provincial "A" (£760 to £860 per annum) of the National Salary Scales.

A house at Bishop Auckland, on a service occupation tenancy, will be available.

Applications, giving details of qualification, age and experience, should be addressed to Mr. F. Wilson, Divisional General Manager, Darlington Division, Gas Offices, John Street, Darlington, not later than October 20, 1955.

F. WILSON,
Divisional General Manager.

NORTH WESTERN GAS BOARD

APPLICATIONS are invited for the following pensionable appointments:—

MID-CHESHIRE GROUP
WORKS FOREMAN, Runcorn Works. (Salary within Grade A.P.T. 6, £565/£645 per annum.)

Applicants should have had experience in control of labour and gasworks routine. A knowledge of horizontal retort plant will be an advantage.

Detailed applications, giving the names of two referees, should be forwarded to the General Manager, N.W.G.B. (Mid-Cheshire Group), Hartford Manor, Northwich, within 14 days.

WIRRAL GROUP
TECHNICAL ASSISTANTS (Production). (Salaries within Grade A.P.T. 7, £620/£700 per annum.)

Detailed applications, giving the names of two referees, should reach the General Manager, N.W.G.B. (Wirral Group), Hind Street, Birkenhead, within 14 days.

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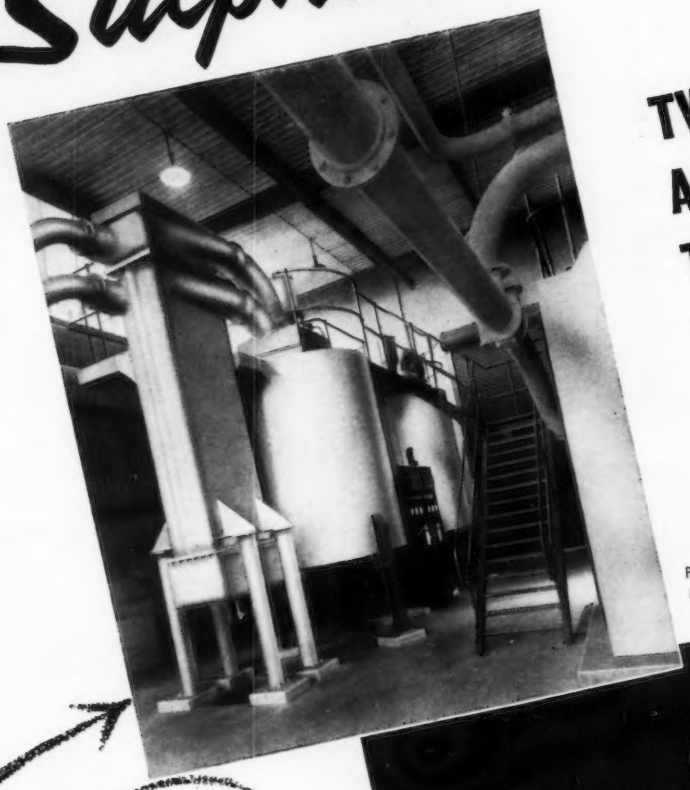
Sulphur Removal

TWO APPROACHES TO THE SAME PROBLEM



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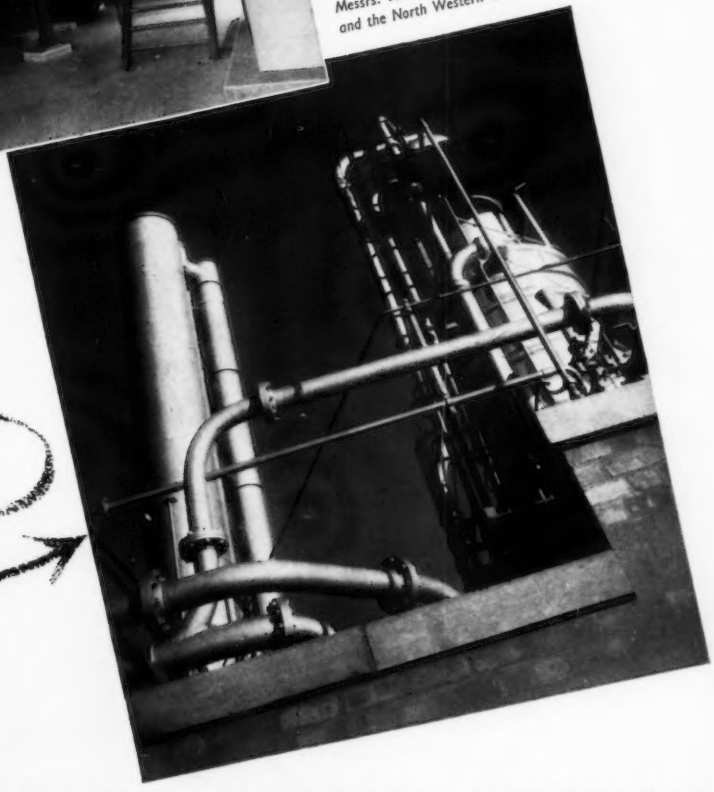
Catalytic Treatment of Gas



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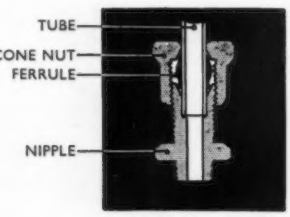
FOR COMPRESSING AIR OR GAS SUPPLIES USED FOR FURNACE HEATING, METAL MELTING, BRAZING, SOLDERING BITS, LAUNDRY IRONS, ETC.

DIRECT COUPLED COMPRESSORS (see illustration right) are fitted with automatic internal by-pass valves and lubrication systems. They are direct coupled to Keith Blackman motors. Type OA compressors in this range occupy a floor space of only 18" x 7½".
CAPACITY RANGE: 100 to 750 cub. ft. of gas or air per hour at 3 lbs. per sq. in. pressure.

TYPE 4 COMPRESSORS (not illustrated) are also fitted with automatic internal by-pass valves and lubricators. The complete unit includes motor and drive on a common bedplate, all of Keith Blackman manufacture.
CAPACITY RANGE: 500 to 20,000 cub. ft. of gas or air per hour at 3-5 lbs. per sq. in. pressure.
AREA OCCUPIED: from 9¼" x 16½" to 61" x 27".

DID YOU KNOW?

KEITH BLACKMAN have been making compression joints for many years and the present design embodies features developed as a result of this long experience. Notice that the shape of the ferrule is such that the joint is made without unduly stressing the tube.



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serving to burn

Note: the four burner heads (right) are for high pressure gas, or low pressure gas and air blast.

LEFT: "Fishtail" type burner with two-armed stamped pattern injector for heating liquid in tanks by submerged combustion tubes. For use with low pressure gas supplies.
Size Range: 1", 1¼", 1½", 2" and 2½" outlets.
Capacity Range: 45-280 cub. ft. of gas per hour.

Brass non-blow-off head types: deal with 5 to 10 cub. ft. of gas per hour.

Stainless steel, "F" type head, burner: deals with 8 cub. ft. of gas per hour.

Perforated head type burner: deals with 10 to 15 cub. ft. of gas per hour.

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GAS FITTINGS

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We specialise in the manufacture of Brass Taps and Fittings for the Gas Industry. Appliances equipped with fittings bearing the mark "M" are to be found in all parts of the world.

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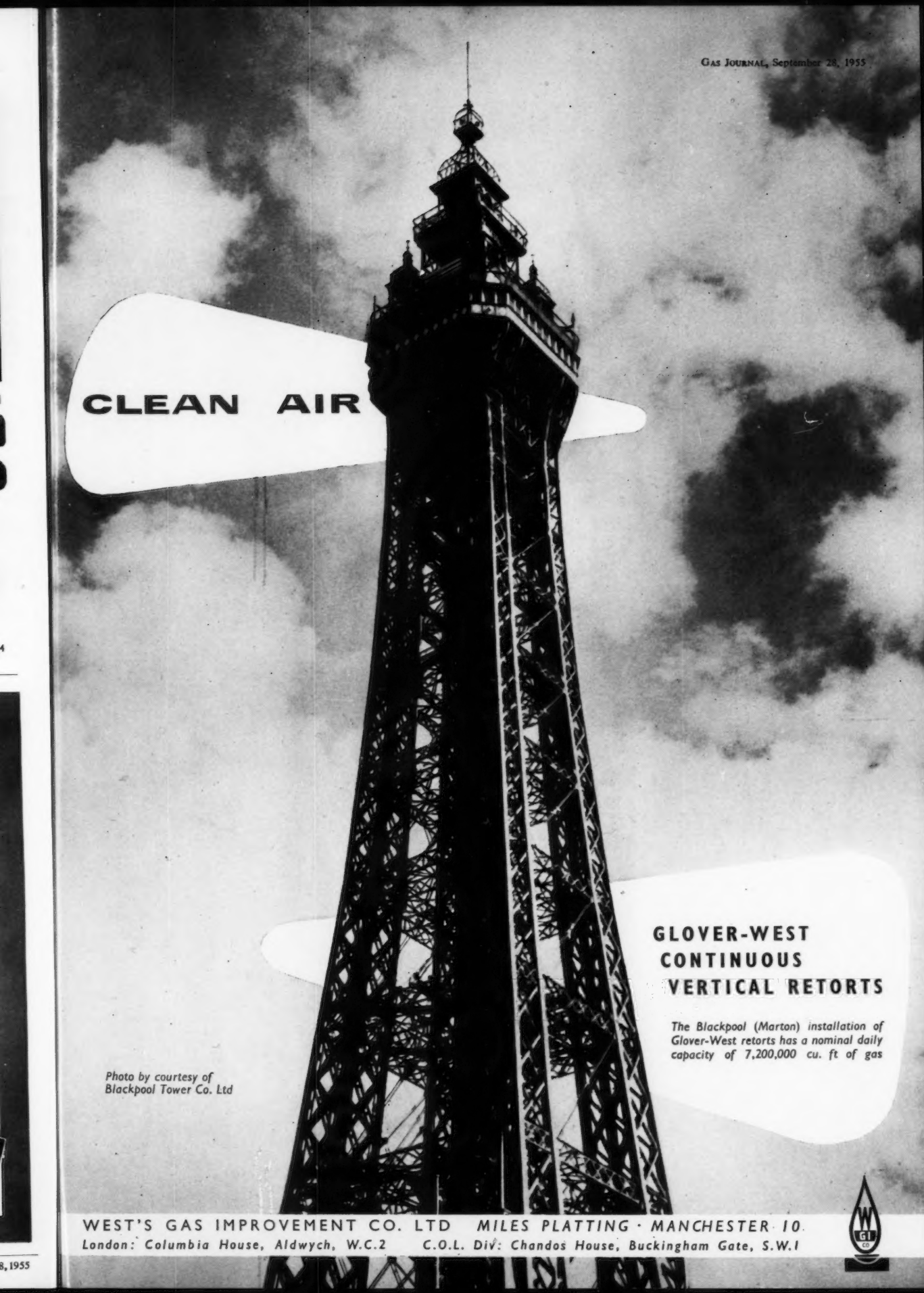

GLOVER-WEST CONTINUOUS VERTICAL RETORTS

The Blackpool (Marton) installation of Glover-West retorts has a nominal daily capacity of 7,200,000 cu. ft of gas

Photo by courtesy of Blackpool Tower Co. Ltd

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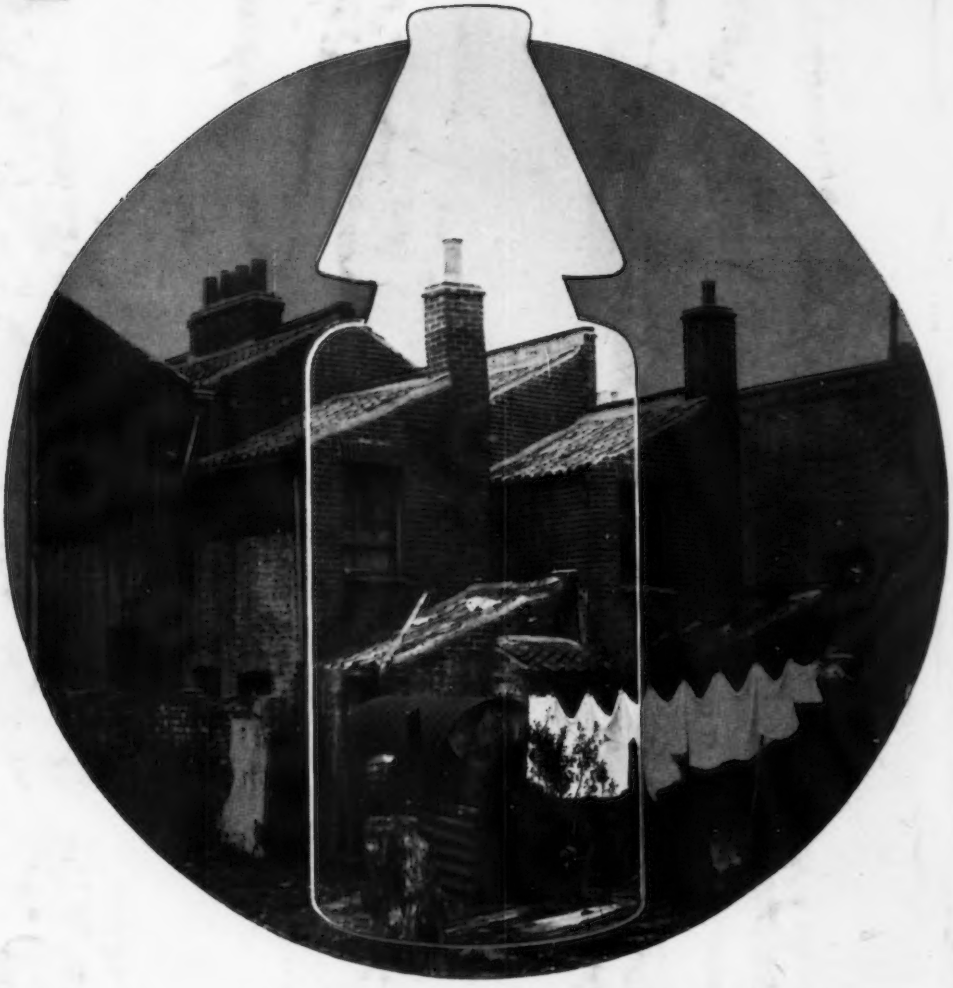
Operation Rescue



and ASCOT

Since one of the important objectives of Operation Rescue is the provision of a hot water supply, the merits of the Ascot system will come under review when plans for improvement or conversion are considered.

It will be found in many cases that the most economical and efficient method of providing hot water will be an Ascot — a multipoint, a bath water heater, or a sink water heater, or perhaps a combination of the last two.

Ascot heaters are, for the service they give, inexpensive to buy. Often they are cheaper to install than some other popular systems because the pipe runs are simple.

They do not burn raw coal, which is in the interests of the householder, his neighbours, and the whole nation.

Because they heat only the water actually required Ascots are economical in use.

Finally, and really most important, they give the householder a first-class hot water service from which he and his family can get piping hot water instantly day or night in an endless flow. Only of an instantaneous gas water heater can it be said that

It never runs cold

The Ascot Technical Department offers full co-operation, and invites inquiries

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